DOCUMENT RESUME

ED 124 121 IR 003 508

AUTHOR	Henderson, Diane D.
TITLE	Report on Alternatives and Considerations for the Design of a Learning Resource Center (LRC) at Georgetown University.
INSTITUTION	Mitre Corp., McLean, Va.
REPORT NO	MITRE-WP-8728
PUB DATE	26 Apr 72
NOTE	142p.; Some portions of Appendix I may not reproduce well due to small type of original document
EDRS PRICE	MF-$0.83 HC-$7.35 Plus Postage.
DESCRIPTORS	Design Needs; *Educational Facilities; *Educational Planning; Higher Education; Information Systems; Instructional Materials Centers; Instructional Systems; *Instructional Technology; *Learning Laboratories; Multimedia Instruction; *Resource Centers; University Libraries
IDENTIFIERS	*Georgetown University; Instructional Development; Learning Resources Centers

ABSTRACT

Among the principal insights developed by the Georgetown University Learning Resources Center (LRC) Planning Group during its period of activity was an understanding of the nature of the entire system of learning resources at Georgetown University of which the proposed LRC will be one of the major parts. In this paper all of the elements of the learning resource system at Georgetown are identified and the capabilities of each, at present and as proposed for the future, are described and analyzed. The implementation for the design of the LRC which would be engendered by the various possible modes of operation of the learning resource system are explored. Finally, the Planning Group's recommendations for equipping and allocating space within the proposed LRC are presented, along with supporting illustrations of some of the possible implementations. (Author)

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THE MITRE CORPORATION

WASHINGTON OPERATIONS

WORKING PAPER

WP- 8728 No. __ Vol. __ Series __ Rev. __ Supp. __ Corr.

Subject: Report on Alternatives and Considerations for the Design of a Learning Resource Center (LRC) at Georgetown University

To: William F. Mason

From: Diane D. Henderson

Task No.: D-20

Dept.: D-32

Page 1 of 140 Pages

Date: 26 April 1972

Approved for MITRE Distribution: William F. Mason
William F. Mason

ABSTRACT:

This paper provides a record of the information and insights developed by the Georgetown University Learning Resources Center (LRC) Planning Group during its period of activity. The principal insight developed was an understanding of the nature of the entire system of learning resources at the University of which the proposed LRC will be one of the major parts. In this paper all of the elements of the learning resource system at Georgetown are identified and the capabilities of each, at present and as proposed for the future, are described and analyzed. The implications for the design of the LRC which would be engendered by the various possible modes of operation of the learning resource system are explored. Finally, the Planning Group's recommendations for equipping and allocating space within the proposed LRC are presented along with supporting illustrations of one of the possible implementations.

Errata

Page 18, last paragraph.

The Planning Group assumed a level of user activity, a number of student users and a level of production activity for the preliminary design stage: about two-thirds of the undergraduate students using materials for about one-half hour per day . . .

Page 37, Table II

Individual learning spaces - single carrels	150-200
Small group learning spaces - multiperson carrels	40-60
Large lecture theaters	4

Page 67, footnote

[3] Harvey, James, "Reforming Undergraduate Curriculum: Problems and Proposals," ERIC Clearinghouse on Higher Education, The George Washington University, Washington, D. C., p. 6.

ACKNOWLEDGEMENT

The author acknowledges with sincere thanks the substantial contributions of the members of the Planning Group without whom the paper could not have been completed. Each member of the group contributed ideas, collected information, and provided draft materials in sections involving his expertise. Special thanks go to Mr. Biagio Melloni for the fine sketches he prepared illustrating the concepts embodied in the group's thinking about the LRC building. Dr. Allen Tucker did a large job of data reduction, summarizing the results of meetings the Planning Group held with faculty and student groups. Dr. J. Gilmour Sherman provided valuable insights based on his day-to-day experiences with use of advanced educational technology in his Department. Mr. Dean Price kept us in touch with general architectural planning at the University and made available information on some specific design concepts which might be used. Dr. Joseph Pettit kept the project moving smoothly and assured that the work of the members of the group was well coordinated, thus contributing greatly to the effectiveness of the effort.

Among those at MITRE who contributed to the work of the Planning Group we owe special thanks to Mr. Warren S. L. Moy and Mr. Francis E. Brooks who initially set up the project and who provided technical direction and many of their ideas to the work. Mr. William R. Flury worked closely with the author, providing detailed technical review and useful comments at each stage of preparation of this report.

This paper represents, in general, a consensus of the Planning Group. The author, however, takes responsibility for its final form.

The drafts, revisions, and revisions of the revisions were typed and proofread by several MITRE secretaries. Without the skill and competence of these young women, the paper could not have been published. Many thanks from the author to: Diane Billings, Madge Cornell, Joan Garber, Pat Hewett, Suzanne Suren, Carol Teachey, and Jean Ward.

FOREWORD

At the time when Georgetown University began to consider constructing a new academic building, a Learning Resources Center (LRC), a Planning Group was established. The charter of this group was to consult with the faculty, to study other institutions, and to propose a plan for the new building.

The Georgetown University members of the Planning Group have been the following:

Dr. Joseph Pettit - Dean, School for Summer and Continuing Education (Chairman)

Mr. Biagio John Melloni - Chairman, Committee on Educational Technology and Mass Media

Mr. Dean Price - Director of Planning and Design

Dr. J. Gilmour Sherman - Chairman, Department of Psychology

Dr. Allen Tucker - Computation Center

Four members of the Technical Staff of The MITRE Corporation have been working jointly with the Georgetown members. They have assisted with systems engineering aspects of the planning under the terms of a Letter of Agreement between Father Henle, President of Georgetown University and Mr. Charles A. Zraket, Senior Vice-President for Washington Operations, MITRE Corporation. The MITRE team members have been Mr. Francis E. Brooks, Mr. William R. Flury, Ms. Diane D. Henderson and Mr. Warren S. L. Moy.

The Planning Group as a whole worked together to produce the paper, "What a Learning Resource Center (LRC) Could Mean for Georgetown University," with the principal authorship responsibility taken by Ms. Henderson, Mr. Melloni and Dr. Sherman. That paper was distributed to all faculty members and to members of the Student Academic Councils. It was intended to begin a dialogue with the Georgetown faculty and students so that their interests and needs for educational technology could be satisfied in the proposed plans for the new building.

The work of the Planning Group has been coordinated with a Faculty Advisory Committee for the LRC consisting of the following people:

Dr. Dorothy Brown - History
Ms. Brenda Eddy - Business Administration
Dr. William Gregory - Physics
Miss Lucille Kinlein - Nursing
Dr. Ross Macdonald - Linguistics
Dr. Herbert Maisel - Computation Center
Dr. Jesse Mann - Philosophy
Rev. Eugene Poirier, S.J. - Economics

The Planning Group is appreciative of the expressions of points of view communicated by the Faculty Advisory Committee which provided insights into some of the problems that might not otherwise have have considered.

During the fall semester, members of the Planning Group visited a number of institutions, corresponded with others and interviewed visitors from still others. A paper, "Preliminary Planning Ideas for a Learning Resource System," published in February, contained information based on the Planning Group's search for external data. It was distributed to a limited number of faculty members who had expressed an interest in it.

In late November and early December, several meetings were held by the Planning Group with members of the faculty at large. Valid complaints about present inadequacies and problems with existing physical plant and maintenance support were voiced repeatedly in those meetings. There were also warnings against technology itself, and hints that technology and technological support have very little to do with education.

The Planning Group is well aware of the many problems associated with educational technology. People tend to equate technology with hardware; however, what we are talking about is neither hardware nor software, but the systematic application of knowledge for practical purposes. In his foreword to Anthony Oettinger's excellent book, Run, Computer, Run: The Mythology of Educational Innovation, Emmanuel Mesthene says, "The biggest obstacle to the rapid and effective introduction of technology into the schools, however, is the structure of the American School System itself, which, in Oettinger's words, 'seems ideally designed to resist change.'" He adds, in a later paragraph: "Major institutional change that can encourage experimentation, flexibility, variety, and competition seems called for before the new technology can contribute significantly to education."*

The observations about American education as a whole are true of Georgetown University. However, the Planning Group has identified the stated and implied requirements of faculty and students for technological support, described present inadequacies, and prepared a design for an improved learning resource system that includes a building with some of the desired capabilities, called a Learning Resource Center. It is quite clear that before Georgetown can embark on a major new program like developing the LRC, it will have to take steps to organize its forces in such a way that it can effectively accomplish its aims. Long-range physical planning that is not based on adequate long-range academic planning is doomed to disaster.

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*Oettinger, Anthony G., with Sema Marks, Run, Computer, Run: The Mythology of Educational Innovation, Harvard University Press, Cambridge, Massachusetts, 1969, pp. ix, x.

In presenting this report, the Planning Group counsels careful study by the decision-makers at Georgetown University and long-range planning to accomplish feasible goals that can be supported by enough faculty members, administrators, and students for them to be achieved. This report marks the end of the Planning Group's activity and the beginning of a new phase of planning by Georgetown for ways to build an adequate Learning Resource System and an LRC, if the will exists to build one. In any case, whether or not there is to be a Learning Resource Center, the existing system must be improved so that basic support like blackboards and chalk can be provided without fail. Even that requires some organizational changes and the assignment of some responsibilities not now assigned to anyone.

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1.0 INTRODUCTION

The charter of the LRC Planning Group called for the production of a set of facility planning guidelines to be used by the architects in designing the LRC. In order to develop such guidelines, the Planning Group undertook a series of discussions and inquiries to determine the role which an LRC would be expected to play in the future academic environment at Georgetown. It became clear at an early stage that there has been little formal planning for the future of the University. Such academic plans as do exist are fragmentary and uncoordinated and not documented. The lack of any agreed upon view of the academic future makes it difficult to plan for the application of emerging technology at Georgetown.

As a result, the Planning Group has had to attempt to intuit the consensus of the unexpressed desires and aspirations of the faculty, administration, students, and employees regarding the future development of the University. To this end the Planning Group sponsored a number of exploratory meetings with various groups in the University and also, quite recently, conducted a formal survey of specific educational technology needs of the academic departments.

Several conclusions have been drawn by the Planning Group. It is clear from the information collected that the Georgetown community wants to move in the direction of obtaining greater benefit from advances in educational technology. The desire to move in this direction is tempered, however, by four considerations.

First, there is a strong desire to render more effective those elements of educational technology which are already present at Georgetown. It is felt in many quarters that adoption of new technology should not even be considered until all of the present problems with existing technology on campus are solved. On the surface this appears desirable but there are limits to the effectiveness of this approach. Even if all the present equipment worked flawlessly and all the classrooms were refurbished, they would not meet even the present levels of demand for educational media materials development and presentation. With growing demands and with a lead time of 4-5 years to develop new facilities it is, therefore, necessary to proceed with two tasks concurrently: (1) to ameliorate present conditions; and (2) to develop a plan for the future that builds upon and evolves naturally from the present. The Planning Group has accepted the concept of dual development: that its attention cannot be given exclusively to either the present or the future but must be directed at both problems.

The second constraint on development recognized by the Planning Group is the strongly felt desire by the faculty to avoid educational gimmickry and to use only "sound, proven approaches" in all plans for the future. It is true that Georgetown has been victimized in the past by gimmick peddlers. The current inventory of educational equipment contains ample evidence of problems in this area.

In responding to this reservation, the Planning Group has determined that the best approach to avoiding gimmickry is to continue, as at present, to rely on the wisdom of the faculty in establishing the proper educational approach but to provide technical support and assistance to the faculty in experimenting with and evaluating new equipment and approaches prior to accepting them for use in the teaching environment.

The third reservation expressed has been that any proposed LRC development should not overtax the already strained resources of the University. To be sure, this is a valid caution. It is tempered by the fact that the LRC facility, if and when built, will be financed by gifts to the capital building fund of Mandate 81. Further, the Planning Group has accepted the concept that the LRC activities should be self-supporting insofar as is possible and should not represent any drain on existing levels of financing.

The fourth and final reservation regarding an increase in the use of educational technology at Georgetown is that such so-called "progress" should not be allowed to change radically the unique character of a Georgetown education. The Planning Group has spent many hours considering this point and has concluded that development of the LRC as a facilitating service used by faculty and students on demand will assure that it will not threaten the unique character of the University. Such a threat could arise only if the LRC were to assume a dominant role in dictating educational policy. Care has been taken in all planning to ensure that this will not happen.

After ascertaining the desire to move toward greater use of educational technology, within the stated constraints, the Planning Group began to work out the details of what would be required in a future LRC. The Planning Group proceeded through the following steps:

1. Determined the scope and nature of the present and projected total system of learning resources at Georgetown.
2. Examined the modes of operation of that complete system of resources.
3. Identified the functions performed by various elements of the system.
4. Selected the functions to be performed within a future LRC (those not likely to be done elsewhere).
5. Computed the LRC requirements based on the functions to be performed and the loads expected.

In the following sections the recommendations of the Planning Group and the relevant information developed during the performance of these steps is presented. It is being made available as a means of encouraging and facilitating constructive discussion of the future of the LRC and of the University.

2.0 EDUCATIONAL TECHNOLOGY

An educational institution may turn to technology for any of several reasons. Sometimes the objective is to reach more students, or to reach them at less cost. Japan bases its secondary education to a great extent on television correspondence courses and radio courses, simply because there are more people than the schools can accommodate. Institutions may introduce new technology for that reason or for others, such as: to provide an improved range of materials, to offer greater opportunity for independent study, to permit more student response, or to adapt instruction to different styles of learning.

Given the goals, philosophy and size of the schools at Georgetown, it is not anticipated that significant increases in faculty productivity will be achieved through educational technology. Rather, it is felt that educational technology will assist the faculty in restoring to their programs levels of quality which were heretofore a hallmark of a Georgetown University education but which lately have withered somewhat under the demands of heavy teaching loads and other responsibilities.

At Georgetown University, there is already a good deal of interaction between students and teachers; it is valued by both groups. The introduction of technology is not desired to make it possible to teach massive numbers of students but rather to enhance the effectiveness of communication between student and professor. Expert utilization of modern educational technology can help students to learn more and to learn it more rapidly. A geographer at Miami University, Oxford, Ohio, was quoted in College Management as saying, "That package of illustrations of three overhead gels made it possible to teach a concept in 30 minutes for which I've needed two class periods in the past."[1]

---

[1] "College Forum," College Management, October 1968, p. 22.

In recent years there has been a growing interest and expanding effort to advance the theory and to improve the application of educational technology. Syracuse University, Syracuse, New York, with a student population of about 9,000 undergraduates, has an organization of more than two dozen people supporting the faculty in designing course programs, preparing audio-visual (including TV) materials, and performing research and development in the field of educational technology, exclusive of the activities of Audio-Visual Services, Film Library and the University Library. The Georgetown University Medical School's Department of Medical-Dental Communication is a recognized example of excellence in the provision of support to faculty and students who want to experience some of the advantages resulting from utilization of modern educational technology. Services of that Department are in such demand that they routinely have a backlog of several weeks' work. The Georgetown University School of Nursing is currently redesigning its entire curriculum and preparing course materials under a grant from the Department of Health, Education, and Welfare. The School of Nursing will allow completion of the requirements for the Bachelor of Science degree in three years or four, and will plan as much as possible for individualization of each student's program.

Discovery of the kinds of learning experiences that will be most helpful to each student can take place in small classes, but if a professor has very large classes other steps must be taken. It may be necessary to take a "shotgun" approach and simply to provide a multiplicity of ways to learn and to allow the students to choose among them. Since people generally like doing what is "easier" -- or find easier whatever it is they like -- students given a free choice of approaches tend to choose the most appropriate learning materials available. Further, with the option of changing to another learning experience if one turns out to be not suitable, students are able to experiment. If a variety of learning materials is available in a variety of different media, the student can select for himself or be guided by the faculty to those materials best suited to his cognitive style. It also appears likely that when students are provided with a number of potentially effective alternative ways to attain a learning objective, and when the meeting of that objective can be tested by the students themselves as they progress through the learning experiences, that they may attain greater satisfaction and improve performance.

Some of the different ways in which technological support may be used are described below with examples:

1. Remedial Use

   The English Department from time to time finds some students deficient in basic grammar. These students are sent off to work through programmed materials (text, Computer Assisted Instruction, slide-tape presentation) to take care of their particular deficiencies, without detracting from the class' work or its progress.

2. Drill on Fundamentals

   The Philosophy Department finds that some materials in the area of logic can be presented very effectively in programmed form. Tuesday classes are replaced by self-paced materials; Thursday classes continue as normal lectures and discussions.

   The Physics Department at M.I.T. finds that physics at the basic level can be more effective when programmed. At various stages, students meet with a proctor, take a test, proceed at their own pace. A few lectures are scheduled when 75 percent of the students have passed certain points in the course and are ready to profit from a lecture or from the interaction involved in group meetings.

Some subjects at some levels seem not to require or gain from group interaction. In these, students work through programs (presented in various media), are tested by student proctors, are referred to graduate students if a more informed view is needed, and to the professor if his knowledge is required. In these the professor meets students only on an individual basis, talking to those whose problems and questions require his level of expertise. Introductory Psychology at Georgetwon is an example of this kind of extensive programming.

3. Enrichment

In most courses at Georgetown extra reading materials are available for the student who is particularly interested in a subject. Students who feel a need or desire for these and other types of materials can request them from the library, from their professors, from departmental holdings or from other sources within or outside the university. In general, there are few AV materials, items of realia, or other media materials available for student use under conditions where they can be obtained with a reasonable effort.

The Medical-Dental Communications Department has prepared a number of Audiscan cassettes for use by medical and dental students in their pre-clinical and clinical phases of training. The cassettes provide audio-visual lessons dealing with special, interesting problems likely to be encountered only rarely in the clinical environment, problems a health practitioner should recognize, nevertheless.

The Learning Resource System described in this paper is a system designed to provide faculty and students with the resources to develop many more alternative learning experiences to suit different cognitive styles by providing different paths to meet objectives, at different rates. This will make it possible for the teacher who wants to define learning objectives and devise multiple learning experiences to obtain effective and efficient assistance in preparing materials and evaluating them. Teachers who do not wish to work in this way will not be required to do so.

As stated in an earlier paper: "Ideally, of course, a Learning Resource Center should be a community of well-trained people adequately equipped with educational facilities located in attractive places to encourage and help students and teachers communicate, investigate and learn together as a team. Translating that idea into a realistic system of services and materials for the particular educational needs at Georgetown, however, is difficult."[2]

In order to determine which needs should be satisfied by the new Learning Resource Center building, it was necessary for the Planning Group to consider all the learning resource requirements at Georgetown, to identify the functions which would have to be performed to satisfy these requirements and to describe a complete Learning Resource System which embraces all of these functions. Then it was possible to identify the functions that are already being performed and to determine where they are being performed. It was also possible to identify functions which are not now being performed but should be. Then, on the basis of this knowledge it was possible to speculate on different ways to configure the organizations and facilities within the entire system in order to satisfy the requirements. Finally, then, it was possible to choose from all the functions a set of functions to be performed within the new LRC building which appeared to be a "comfortable" fit. That is, the assignment of these functions to the future LRC would require no unacceptable disruption of present educational organizations or facility planning.

---

[2] M71-62 "What a Learning Resource Center (LRC) Could Mean for Georgetown University," October, 1971, p. 3.

2.1 Identifying Tasks to be Performed

In the many meetings with representatives of faculty and students, the Planning Group identified a specific set of tasks to be performed by the Learning Resource System. The following kinds of support and services were desired:

- Provide facility and logistic support for learning spaces of various kinds. This includes everything from chalkboards to sophisticated audio-visual equipment and instructional programs.
- Operate a reference service and current awareness service of print and non-print materials available commercially or from other universities, as well as full information on everything developed or under development at Georgetown University.
- Offer assistance in the production of teaching aids, including all kinds of graphics, models and realia.
- Present orientation workshops and seminars in materials and techniques for development and use of various kinds of technology in education. Train faculty and students who wish to produce materials.
- Arrange for providing and assigning of learning spaces
  - (a) Individual and small group spaces
  - (b) Large group learning spaces
  - (c) Various special-purpose learning spaces.
- Give production support for the development of self-teaching programs.
- Take charge of the administration of "canned" instructional packages.
- Assist in the testing and evaluation of materials produced at Georgetown or acquired elsewhere.

It is the Planning Group's belief that the services above are listed in approximately their order of priority as desired by the faculty. Each of the services requires support of one or more of the functional subsystems of the Learning Resource System. These subsystems were described earlier in the paper "Preliminary Planning Ideas for a Learning Resource System." The subsystems deal with print and non-print materials, computer software and services, facilities (both learning spaces and installed fittings), and equipment of all kinds, and encompass the following functions:

Production, acquisition
Inventory, indexing, cataloging
Storage and retrieval
Delivery and circulation
Maintenance and repair
Evaluation, testing
Staff development, user training
Marketing, funding

All of the functional subsystems are either specifically mentioned in the list of system tasks or are implied by the nature of the tasks. Some of the functions are already being performed, for some types of material. It would be possible to show a diagram of the current, incomplete arrangements. An orderly view of the entire system is required, however, for a proper perspective in the design of a more comprehensive system.

2.2 System Flows

Figure 1 presents a flow diagram of the entire Learning Resource System showing the functional subsystems and their interrelationships. Educational materials of all kinds are produced at Georgetown University or obtained from outside sources. Following a test/evaluation procedure, they are indexed and stored. Materials, once in the Learning Resource System, are available for delivery and/or circulation. If the material was produced at Georgetown University, it may also be offered for sale to the broader educational community in response to expressed needs in the educational community. Requirements at GU are, of course, the strongest determinant of what is to be produced. The maintenance function is performed before the material is returned to storage. The Learning Resource System includes work with many different types of materials. Different materials themselves have some characteristics that make special handling necessary. For example, storage

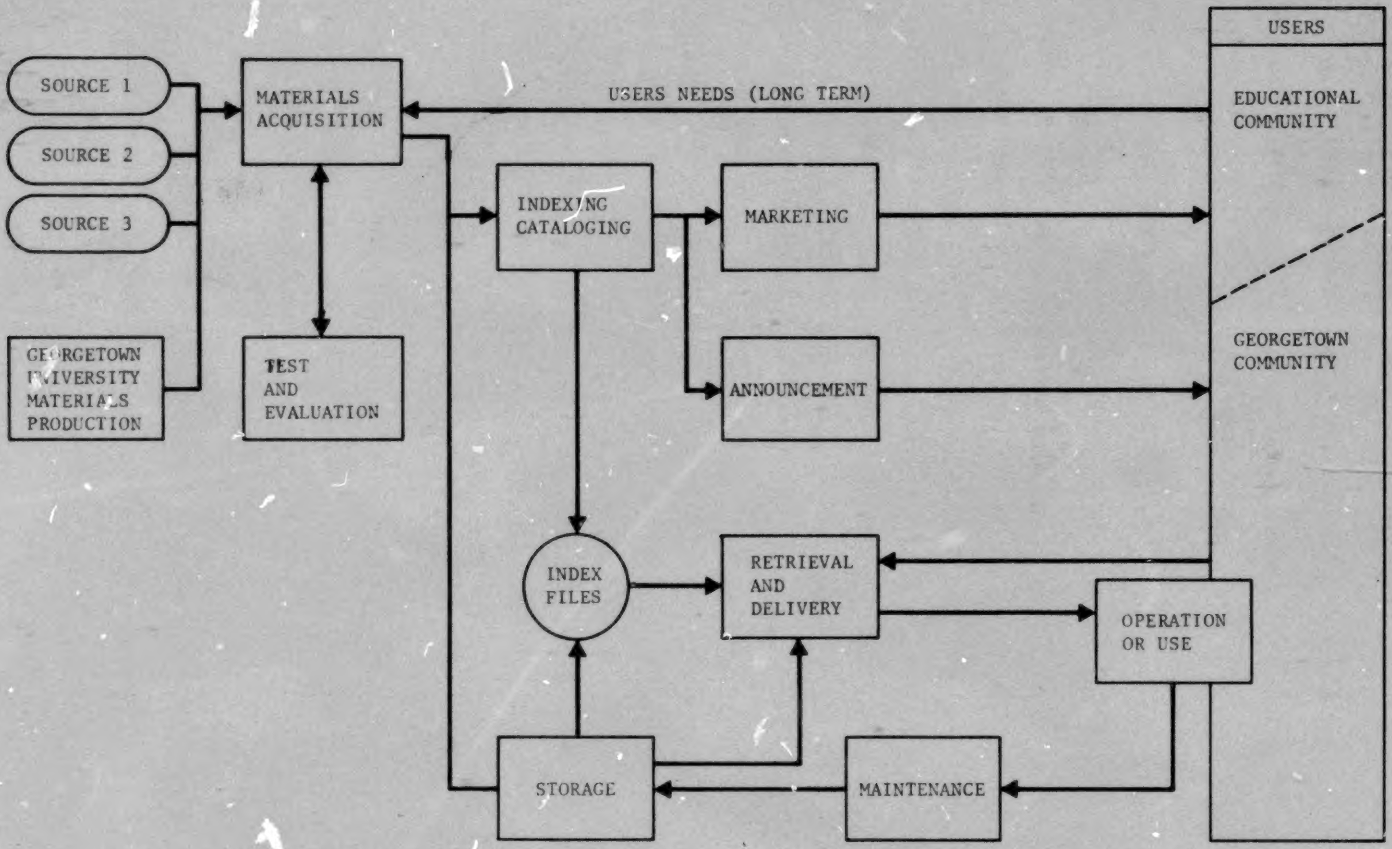

FIGURE 1
FLOW DIAGRAM OF A LEARNING RESOURCE SYSTEM

spaces for audio cassettes differ greatly from those required for large physical models. In some cases there are no differences. For example, it appears likely that the management of the storage for both types of materials might be performed by the same people.

The Learning Resource System detailed here is general. Each of the functional subsystems must be developed to some level of sophistication, but they do not all have to be equally sophisticated. In fact, some of the choices in designing alternative feasible systems are between different levels of performance of selected subsystems.

In addition to the functional subsystems themselves, there is a set of information systems which are necessary to their successful functioning. If the Learning Resource System were a very large one, handling hundreds of motion picture films and thousands of audio tape cassettes, scheduling 200 classrooms and containing circulation records for the entire holdings of the Library, an automated information system might be desirable. But for the size of the system expected at Georgetown with relatively few people and materials about whom and about which information must be kept, card files or other conventional records will probably be sufficient. However, it must be recognized that the supporting information system is necessary for the effective functioning of the Learning Resource System, just as parts inventories are necessary to an efficient manufacturing operation. It may be possible to keep the factory going for a time without the inventory control, but efficiency will quickly deteriorate.

Table 1 indicates some of the administrative support information systems for the Learning Resource System. The information requirements are organized along the lines of supporting subsystems and materials subsystems.

2.3 Components, Subsystems and Interrelationships

The Learning Resource System is multi-dimensional, having at least three dimensions. The functional subsystems, just described,

TABLE I

ADMINISTRATIVE SUPPORT INFORMATION SYSTEMS FOR THE LEARNING RESOURCE SYSTEM

Personnel information system

- basic data
- skills data
- project experience data

Equipment inventory data system

- basic data
- purchase and use history data
- maintenance history data (for preventive maintenance studies, etc.)
- location data (could be used to manage circulation)

Facilities inventory data system

- basic data
- usage/repair history data
- special equipment installed
- other special features
- scheduling information for the current semester
- theater seat inventory for ticket sales, by performance

Materials inventory data system

- Catalog of Computer programs available inside and outside the system
- Catalog of print materials available inside and outside the system
- Catalog of non-print materials available inside and outside the system.

are supported by a set of subsystems which include people, facilities and equipment. These can be further divided by types of materials being processed. For Georgetown these materials will include:

- Print materials

    Books, reports, periodicals, programmed texts

- Non-print materials

    Microfilm, microfiche
    Audio tape (Reel and cassette)
    Motion pictures
    Video tape
    Graphics: still pictures, slides, maps
    Physical models, realia
    Live presentations and interactions

        Theater, psychodrama, conferences, simulations

- Computer software and services

Figure 2 shows a concept of the entire system as a three-dimensional model. For each type of material, there are functional subsystems in which, in many cases, the functions closely resemble those performed with respect to another material. For example, the Library catalogs books. The inventory/cataloging functions for motion pictures and microfiche may be sufficiently similar to make it feasible for a slightly expanded cataloging group to handle audio-visual materials that are stored in other places than the Library as well as those now in the Library. One of the alternative system designs considers this approach.

The three dimensional system diagram in Figure 2 is useful for conceptualizing the interrelationships of the subsystems, but two dimensional tables are easier to use for any detailed listing of sub-functions and system sub-elements. Figure 3 shows one material subsystem as it might appear in the two-dimensional tabular form which is used for Tables 6 through 13 (given in Appendix I). The functions are presented there in some detail but they are not intended to be complete. Their purpose is to allow comparisons of one subsystem to another, so that the decisions can be made in designing alternative feasible systems.

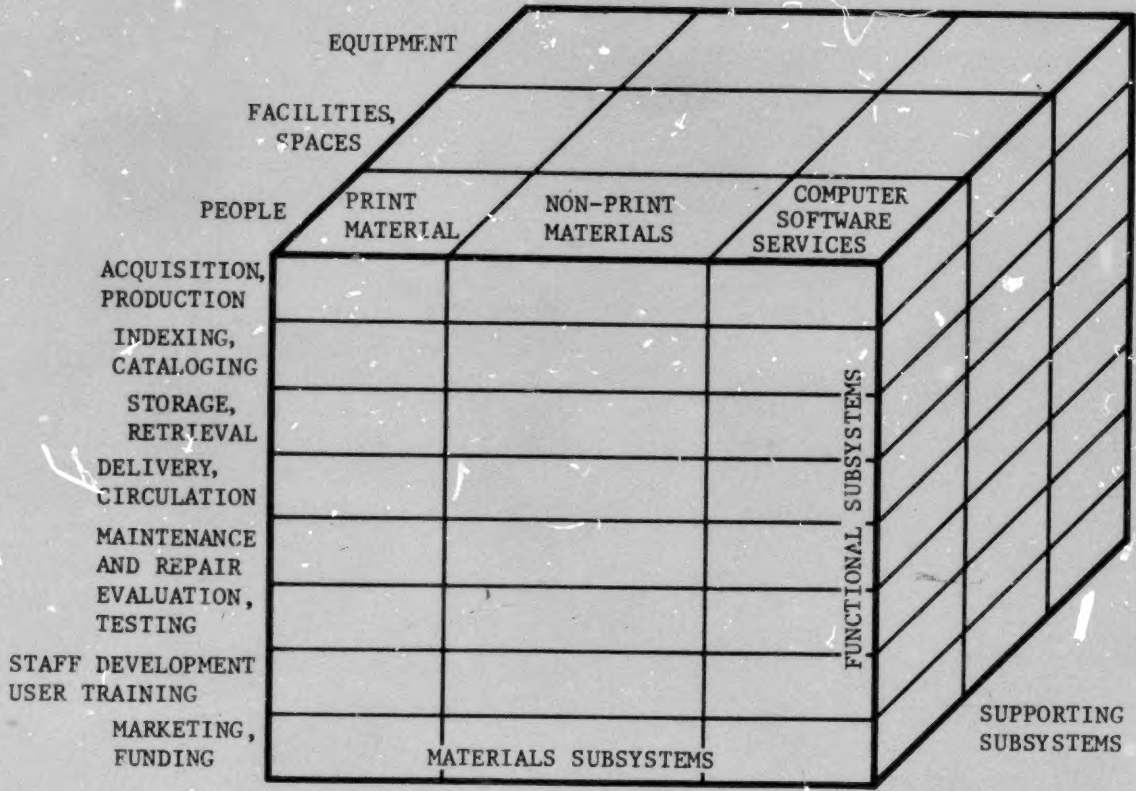

FIGURE 2
LEARNING RESOURCE SYSTEM

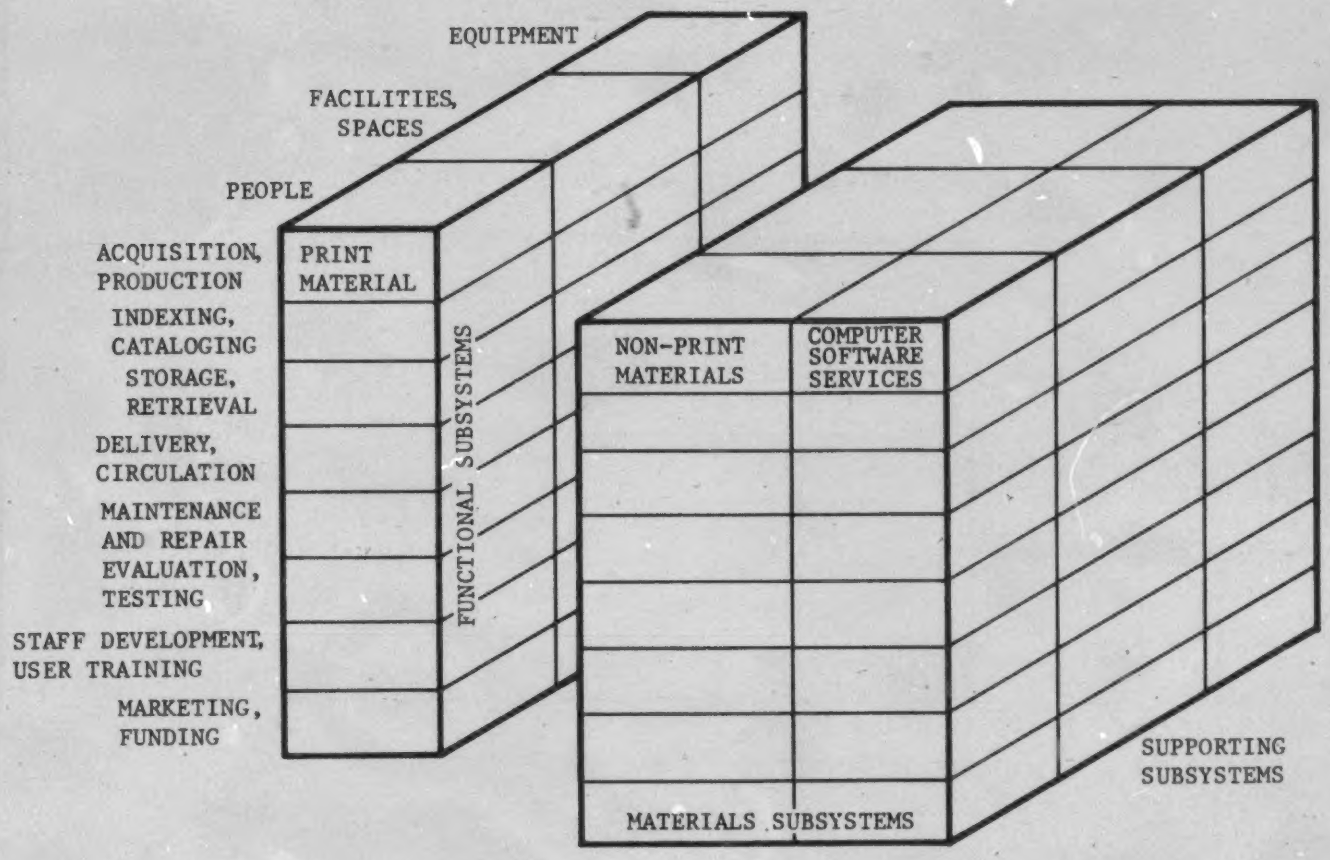

FIGURE 3

FUNCTIONAL SUBSYSTEM ELEMENTS AND SUPPORTING SUBSYSTEMS FOR PRINT MATERIALS

2.4 Sensitivity of the System to Changes

Certain types of operations, with certain types of materials place heavy demands on one or more of the supporting resources. Production of learning materials requires resources, and has an impact on the system as a whole because it causes other system activities -- evaluation, indexing, storage, circulation, marketing -- to be performed in addition to the production.

Whether the production activity is carried out by students, faculty members or LRC staff, the effects on all parts of the system are significant. Development of materials by students and faculty requires support from consultants and some activity by members of the production staff in user training for the various production tasks. Students and faculty will learn about editing videotapes or writing scripts for instructional programs to be presented as a slide-tape show. As the pool of knowledgeable people grows over a period of time, there will be less of a burden on the production departments, but even with experienced faculty members available there will always be a requirement to teach new students. This effort will affect other production work to some extent. The system would be swamped if a professor told 30 students to make a five-minute videotape for a term project. In order to prevent overloads, it will be necessary for professors to consult with the LRC staff before assigning projects or beginning their own, so that a reasonable workload can be planned on a semester or year long basis.

Another area of sensitivity is in the depth of indexing of audio and video tapes, and motion pictures. These materials are not easily used for browsing, and must be auditioned or previewed in almost their entirety for sufficiently deep indexing to make it unnecessary for a potential user to preview the material.

Audio and video tapes of class lectures can be indexed by course number, lesson or lecture number, lecturer's name and date, and can be made available immediately after the class for review. Other audio visual materials are expected to require more indexing, so that acquisition of large quantities of tapes and films could be expected to affect the indexing department significantly.

The system is sensitive also to increases in the number of students, requiring additional carrel space and more copies of the learning materials they are to use. It is sensitive to student and faculty demand for more, different materials; such a demand requires additional production, or outside purchase of evaluated materials, or both.

Other aspects are sensitive to a lesser degree, but all activities of the Learning Resource System should be planned in terms of some generally agreed long-range academic goals so that this development can take place in an orderly fashion.

The Planning Group assumed a level of user activity, a number of student users and a level of production activity for the preliminary design stage: about two-thirds of the undergraduate students using materials for about one half per day, and the production of one or two courses per semester. If much greater activity were anticipated, substantially more physical space and a significantly larger staff would be required.

3.0 LEARNING RESOURCE REQUIREMENTS

In Section 3.1, the Learning Resource System that presently exists at Georgetown University is described. The Planning Group obtained information about the existing system from its own members, from consultation with others and from a series of open meetings with students and faculty members. The faculty mentioned a number of specific needs they felt should be met before any elaborate ventures in sophisticated technology, if any, were undertaken.

Recommendations, made by the Planning Group Chairman to the Academic Vice President, are discussed in Section 3.2. Many of these resulted from the suggestions made in the meetings with faculty members and students. They concern steps that can be taken to improve the Learning Resource System prior to the building of a new academic building. The current and near future needs are described in the context of an evolving overall system.

Finally, performance goals for the Learning Resource System in the 1975-1980 time period are described in Section 3.3.

3.1 Present Situation

3.1.1 Present Uses of Educational Technology

The current uses of educational technology at Georgetown University constitute the baseline system of learning resources. There are five main areas of activity in educational technology at present:

1. The Department of Medical-Dental Communication produces audio-visual and other instructional aids for the faculty and students of the Medical and Dental Schools. The faculty members request support and the Medical-Dental Communications staff conceives and prepares materials, usually in consultation with the faculty. Overhead projector illustrations for classroom use and Audiscan cassettes for self-learning are major products.

Each laboratory in the Basic Science Building has CCTV monitors, and the Basic Science Building has a centrally switched TV studio. A number of laboratories and lecture halls can serve as origination points. Almost all lectures are recorded on audio cassettes. They are available in the Medical Center Library less than an hour later.

2. The Audio-Visual Department of the Lauinger Library has 30 study carrels with TV and audio capabilities handled by a dial-access system, but lacks sufficient instructional materials to utilize them at present. It also has a very small TV production studio with two cameras, monitors and lighting. There are two audio-visual classrooms, each equipped with two large TV monitors and with screens and equipment for showing still and motion pictures. The classrooms can hold about 50 students each, and are almost constantly in demand. The Library has six microfilm readers, but little microfiche equipment.

3. The Computation Center has an IBM 360/40 computer and appropriate on-site peripheral equipment. There are no interactive student terminals. Student and faculty jobs are submitted for sequential batch processing; no multi-processing capability has yet been implemented.

Assistance to computer users is provided by the center staff which includes some student assistants. Most users do their own programming with some help from the staff. Many students use programs that have been prepared and placed in the system's program library for their use.

Computer simulation models are developed and used by the faculty and students of the Schools of Business and of Foreign Service and of the Economics Department. Some simulations have been obtained from other universities. An Economics Department faculty member would like to have a City Model developed by economists at the Environmental Protection Agency (EPA) for urban studies work.

4. Language laboratories for oral-aural study are used by the School of Languages and Linguistics for foreign language instruction and for the programs in simultaneous translation and in English as a second language. VTR units, video-tape and TV monitors are used extensively for language teaching methodology courses. A special classroom with a multi-channel sound system for training the simultaneous interpreters is used for a number of translation courses and can serve as a site for international multi-lingual conferences.

5. The Personalized System of Instruction (PSI) is used in the Department of Psychology. It consists of instructional materials in introductory psychology based on behavioral objectives and relies on a system of student "proctors," or tutors - students who have just mastered the materials - for repeated testing, immediate scoring, and enhancement of personal-social aspects of the course.

A PSI newsletter is published at intervals by Dr. J. G. Sherman, Chairman of the Psychology Department at Georgetown University.

These activities are all relatively independent and unconnected, without being part of any long-range academic plan for the university. All of them can be related to one part or another of the system flow diagram presented in Section 2.3.

In terms of that system flow diagram (Figure 1), the materials production activity of the existing system is concentrated in the Department of Medical-Dental Communications (audio-visual materials and television), in the Department of Psychology (Personalized System of Instruction, PSI, programmed materials) the Department of Fine Arts (theatrical productions and limited use of videotape), and the School of Languages and Linguistics (language tapes, and videotapes for teaching methodology).

Outside materials are acquired by purchase and rental, and consist mainly of books for the Lauinger Library and the Law and Medical Center Libraries, or films -- usually rented -- from commercial sources or from other universities' film libraries. There is very little information from testing and evaluation of materials that is shared within the Georgetown University community.

Indexing and cataloging are performed only for the materials held by the libraries. Other materials and equipment are stored by whoever purchases them, and are not inventoried in any formal way. Since there is no central purchasing of equipment or materials, duplicate purchases may be made without anyone's knowledge, and less than excellent equipment may be purchased by inexperienced buyers.

An inventory of equipment made in 1971 by the University's Committee on Educational Technology and Mass Media revealed that there are many different kinds of audio-visual and television equipment, located in a wide variety of places and owned by many different schools and departments. Central purchasing of such equipment following some guidelines for standard equipment could probably effect economies of scale and provide better service, while minimizing incompatibilities and unnecessary duplication that the university cannot afford.

Only the rudiments of a retrieval and delivery subsystem exist for non-print materials. The Lauinger Library has the capability to provide installed equipment and software in its two special classrooms and selected audio and video programs via the carrels which communicate with the dial access system. Other delivery systems include the SLL language laboratories, and the class meetings of basic psychology classes, when students, student proctors, and the teacher meet at specified times so that the students may use the programmed materials and have access to expert help at the same time. This interaction has aspects of both delivery and operational use, which begins when the student has the materials in hand. It is not really possible, in this situation, to separate delivery and use.

The existing maintenance subsystem is fragmented and cannot provide comprehensive service. Technicians at the Medical Center maintain and repair the equipment there. Audio-visual equipment on the Main Campus may be serviced, for a fee charged to the department requesting the service, by an engineer from the Georgetown Forum. The School of Languages and Linguistics has its own maintenance arrangements.

3.1.2 Assessment of Requirements as seen by the Faculty and Students, Fall 1971

The following is a summary of the Georgetown community's ideas concerning the Learning Resource Center (LRC) planning effort. These ideas, elicited from faculty, student representatives, and others by the LRC Planning Committee, came out of the meetings and pieces of correspondence listed below. Each meeting was attended by the Planning Committee and a part of the community, as indicated in the list of meetings. Each piece of correspondence was submitted to the Planning Committee by an individual as indicated in the list of written communications.

Meeting	Time	Principal Attendees
1	11/18/71 9 am	University Librarian
2	11/18/71 11 am	Science Faculty
3	11/18/71 2 pm	Classics, English, Psychology, Theology Faculty
4	11/19/71 9 am	SLL Planning Committee
5	11/19/71 2 pm	Nursing, Sociology Faculty
6	11/05/71 9 am	Student Academic Council Representatives

Meeting	Time	Principal Attendees
	12/02/71 9 am	Graduate Student Organization
7	12/02/71 11 am	Economics, Government, History, SFS Faculty
8	12/02/71 2 pm	SLL Faculty
9	12/03/71 11 am	Athletics, Library Staff
10	12/03/71 12 pm	Economics, Psychology, SFS Faculty
11	12/03/71 2 pm	Fine Arts, Nursing, SBA, SLL Faculty, University Registrar
12	01/21/72 1 pm	Fine Arts Faculty and Invited Guests

Correspondence	Date	Author
13	11/05/71	Dr. Charles Kegley, SFS
14	11/15/71	Philip Patterson, Economics
15	12/07/71	Elmer Broxson, Michael Foley, History
16	01/14/72	Dr. Othmar Winkler, Business
17	01/21/72	Dr. Donn B. Murphy, Fine Arts

Since most meetings were sparsely attended and written communications were few, this summary may be considered representative of the community's thoughts about the LRC only to the extent that the thoughts of the silent majority were accurately mirrored by the comments of those who attended the meetings and who made written comments.

Each of the ideas expressed in these meetings and pieces of correspondence falls into one of the following categories:

- Recommendations for Immediate Action directed to improvements which ought to be made to the present Georgetown teaching facilities, regardless of the direction the LRC planning effort takes.

- Recommendations Related Directly to the Functioning of the LRC and which cannot be practically considered until the LRC is completed. These recommendations are presented in a later section.

- General Reservations about either the whole LRC effort or some aspect of it.

This summary is thus divided into three sections, each containing those ideas which fall into one of the first three above categories.

For documentation, each idea noted herein is identified, with respect to the meeting(s) and/or the correspondence in which it was introduced, by enclosure of the appropriate number(s) in parentheses.

3.1.2.1 Faculty and Student Recommendations for Immediate Action. It was generally felt that present classroom (i.e., non-lecture hall) facilities, such as blackboards, chalk, electrical outlets, window shades, temperature, lighting, and acoustics, should be upgraded and better maintained (2, 3, 5, 7, 8, 11, 15). Such improvements should allow every classroom easily to accommodate a reasonable amount of blackboard use as well as an occasional audio-visual presentation (e.g., slides, filmstrips, overhead projection). Although audio-visual projection equipment need not be permanently installed in class-rooms, a capability to deliver such equipment to any classroom, as well as to maintain such equipment, should be established.

Similarly, every lecture hall should have the above basic facilities, and in addition should have built-in projection equipment and sound systems which can be controlled from the lectern (2, 3, 7, 11). Portable microphones should be available for use in all lecture halls (3, 7).

A centralized capability to procure, catalog, and deliver audio-visual materials (films, slides, transparencies, maps) should be established and announced to the university community (7, 8, 11).

Information about novel teaching modes and materials already in existence at Georgetown should be well-publicized (3). Tours could be designed to familiarize interested faculty members and students with, for example, the Medical-Dental Communication Department, self-paced courses of study, and uses of the computer in certain disciplines (6). In addition, information about novel learning modes in use outside of Georgetown should be disseminated (15), and individuals from other universities should be invited to discuss these modes with interested Georgetown people.

Two special immediate needs were also mentioned. First, a number of desk calculators should be made available for student use (3, 5). Second, special selectric typewriter fonts for typing foreign language text should be procured (8).

3.1.2.2 Recommendations for New Learning Resources which should be implemented in advance of the LRC's completion

Interest was expressed for establishing a means of procuring, evaluating, and delivering programmed learning materials for use in courses of study where substantial need for remedial and/or drill work is evident (2, 5, 7, 13). Programmed learning materials, whether administered through workbooks or through computer-assisted instruction terminals, are available in great abundance, but are of varying quality. Initially, a digest of information about such packages that might be appropriate to Georgetown's particular needs should be compiled and made available to the interested departments and schools for evaluation.

Many people expressed the need to expand their range of familiarity with the various novel learning modes in use at other universities (7, 11, 15). Only after having gained exposure to real uses of such techniques as computer modeling, self-paced instruction, videotaping, etc., could they more objectively anticipate their own demands on the LRC. In that interest, special bibliographies of materials about the uses of such innovations should be made available to the various departments on a very selective basis. An interested individual would then have a means of establishing contact with outside experts in his own field. Furthermore, since many Georgetown students themselves have experienced the use of such modes, they should also be consulted in such deliberations.

In addition, such experts might be invited to Georgetown to demonstrate and discuss such modes, especially those applicable to a wide range of disciplines. Two particular kinds of learning resources presently appear to fall into this latter category. A presentation of the goals and achievements of self-paced learning should be widely attended. A workshop of this kind is planned for the 1972 summer session. Second, a panel discussion/presentation on the uses and misuses of computers in undergraduate and graduate education seems appropriate at this time.

There is an immediate need to begin measuring the anticipated demand for new learning resources which would ultimately be provided by the Center (11). Tentative answers to such questions as the following must be made to provide estimates for system planning. Detailed system design will require detailed, specific answers to them.

> "How many classes might require TV monitors for delivery of either videotaped or commercially broadcast presentations?"
>
> "How many courses might use self-paced instruction?"
>
> "What courses would use the computer? For those, are interactive terminals appropriate?"
>
> "How much and what kind of demand will there be for on-campus production of audio-visual materials?"

In short, the Planning Committee now has a good idea of what functions the LRC should perform. Next it must estimate how much of each will be required.

Following a meeting of the Planning Group and the Faculty Advisory Committee in late February, and in response to the request of the Faculty committee, a subcommittee of both groups designed a questionnaire which was then sent to all department chairmen. Its purpose was to obtain more specific information about the extent of each department's present and anticipated future use of various capabilities that could be provided in a Learning Resource System. The questionnaire and its results are presented in Appendix II.

One point, mentioned repeatedly, was that as individuals in specific disciplines begin (or continue) exploring new modes of instruction, some compensatory scheme must be established soon (2, 3, 11). This would include the following:

1. Establishment of channels for obtaining financial support for development of course materials.

2. Assurance that faculty effort thus spent receives recognition comparable with that received for research and publication, at the time of consideration for promotion or tenure.

This would certainly help motivate an individual to spend the time and energy necessary to develop and experiment with new learning methods and materials, and which he would otherwise be inclined to spend on a more rewarding venture.

3.1.2.3 General Reservations. Some faculty members and students expressed concern over the Georgetown-MITRE relationship in the LRC planning effort (3, 7, 11, 15). The following questions are representative of those that were raised:

> "Under what long-term obligations to MITRE does this alliance commit Georgetown?"
>
> "What's in it for MITRE, if they're donating technical expertise freely?"
>
> "Should Georgetown associate itself in such a working relationship with a Defense Department contractor?"

These questions were answered as follows: First, the nature of the Georgetown-MITRE alliance was spelled out in Fr. Henle's Letter of Agreement (published as an appendix to the paper "What A Learning Resource Center (LRC) Could Mean for Georgetown University").

The first two questions are answered in the Letter. The third question was of the "Have you stopped beating your wife?" type and was, thus, more difficult than the others. In one sense it was completely irrelevant in that it did not bear on the work assigned to the Planning Group. Nevertheless, it was considered important for the Planning Group to address the question since any widespread dissatisfaction with the constitution of the group might inhibit the free communication desired with students and faculty. In responding to this question the Planning Group reviewed with those concerned the careful consideration which had been given to the relationship by the administration before agreement was reached. The Planning Group also provided additional information about MITRE and the corporation's very substantial record in public interest work, not only with DoD but with many other organizations. This exchange of information with the concerned parties apparently satisfied them; there were relatively good communications with the Planning Group from that point onward.

The second concern was a doubt whether either the Planning Group or the faculty will have any real influence over the final LRC design or activity (7, 11, 15). Some felt that the LRC is already a fait accompli, and hence that faculty recommendations could not influence that design in any real way. Related to this concern was the question of who would set priorities for implementing recommendations (11). The feeling was apparently that unless a recommendation receives top priority it will not be implemented very soon, so why bother making recommendations?

A final concern expressed was that the LRC planning effort not get carried away with a lot of technological gadgetry, while ignoring the basic interpersonal characteristics of the educational process at Georgetown (6, 15). A paramount overall goal of the LRC planning effort should be to obtain a design which fosters, rather than inhibits, meaningful interaction, both formally and informally, among faculty members and students. In addition, it was emphasized that the goals of educational technology at Georgetown should remain modest. The Planning Group has tried constantly to keep in mind the valid concerns of the faculty members.

The Planning Group did not recommend that child care facilities (11) be included as part of the Learning Resource Center. Unless courses are taught which require the observation of young children at play, the children would not play the part of a Learning Resource. However, some members of the faculty and some members of the Planning Group believe that a child care facility for university employees and students would be a highly desirable service and the Planning Group suggests that the idea be considered for the Main Campus separately from the planning for the LRC. A child care facility does operate at the Medical Center, but time did not permit the investigation of its activities.

3.2 Planning Group Recommendations for Immediate Implementation

3.2.1 Recommendations

In February 1972, the Chairman of the Planning Group for the Learning Resource Center presented, in a memorandum to the Academic Vice President, a limited set of general recommendations for steps to be taken immediately "to improve the capability of present classrooms to support the audio-visual needs of the faculty." Specific detailed recommendations followed in March in memoranda to Fr. Fitzgerald after the completion of a survey of classrooms and of the equipment available in them.

Recommendations include the following:

- assign responsibilities for maintenance;
- improve some classrooms at once;

- provide service for making 35 mm. transparencies;
- provide support for production of videotapes of CCTV quality;
- make portable audio-visual equipment available for loan in each major classroom building.

3.2.2 A System View of the New Services

Implementing the recommended improvements would fill in some of the obvious gaps in the present system. A basic capability to produce graphics from existing illustrations (slides from maps in a textbook, or from a set of color plate illustrations) would be, for Main Campus, a rudimentary production capability with which the faculty and students could experiment to gain insight into their probable future needs for such services. The same is true of the experimental use of videotape.

Arranging for maintenance and repair support to the existing and anticipated basic audio-visual equipment would fill in another major gap in the existing system and would encourage the use of audio-visual materials as well as their production. If maintenance service were reliable and efficient, many of the frustrations associated with using technological aids in teaching might disappear. The hostility to gadgets, displayed by many faculty members, can be readily understood when one realizes how prone gadgets are to malfunction. Impatience with dusty chalk and defective blackboards is equally understandable; blackboard inspection and improvement is required. It is part of the maintenance function to check on power supply and room-darkening capability periodically, and to make improvements when defects are discovered or reported by users.

Installing equipment in some classrooms and storing other equipment where it can be borrowed easily will extend the delivery capability for audio-visual aids. Easier access to equipment is expected to increase its use and acceptance by users. No indexing will be performed for the slides produced, since it is assumed that their storage will be the responsibility of the faculty member for whom they are prepared. Departments may wish to develop a departmental collection of slides, but there will be no support initially from the Learning Resource System for either indexing or storage of slides. Later, slides prepared for instructional use could be indexed either individually or as part of a learning package. The storage subsystem would extend only to selected equipment at first, but eventually would handle all LRC inventoried equipment at various locations.

Testing and evaluation would not be formalized either. Experience with malfunction of equipment should be documented in a memorandum to the Committee on Educational Technology and Mass Media so that standards and guidelines may be developed over a period of time; eventually they will affect the acquisition function.

Critical evaluation of the educational software -- films, audiotape cassettes, programmed materials -- considered for use should be documented for the benefit of others who might plan on using the same materials. Materials that are actually used in an instructional setting should be evaluated by student and faculty users in terms of their contributions to the attainment of the course objectives, so that experience can contribute to their improvement or to better utilization of materials in the instructional context. Documented evaluations could be used to assist in decisions regarding the activities the production subsystem should undertake and their priorities.

3.3 1975-1980 Projections

The faculty and student meetings with the Planning Group indicated that most instruction at Georgetown is not going to change radically in the near future. There are projections of some gradual growth in the size of the student body over the next several years, as faculties, dormitories, and classrooms can be expanded. There will be a new academic building which can incorporate some, if not all, of the desired capabilities for innovative teaching. Just as facilities for new teaching techniques are required, so is there a need for facilities to permit the effective utilization of existing well-known techniques that cannot now be used.

In the preceding two sections, discussions of all the supporting subsystems -- personnel, facilities and equipment -- have been related to various functional subsystem activities. That approach is taken in this section as well, but with greater emphasis on the facility or space requirements than on the personnel and equipment details. A detailed presentation of personnel and equipment support in relation to functional subsystems is presented in tables in Appendix I.

Since the planning project was undertaken initially with a view to providing the academic inputs into what was essentially a physical planning program, an emphasis on discussion of facilities is quite appropriate at this point. In this section, presentation is along the lines of the functional subsystem organization, as if the diagram from Figure 2 were sliced as in Figure 4. The personnel, facilities, and equipment related to various functions with various media are described. Figure 4 shows one of the two-dimensional "slices" on which this section focuses.

3.3.1 Performance Goals for Design Estimates

Before describing the supporting subsystems, it seems desirable to state briefly what kind of system activity might be anticipated. In the discussion below, to make the estimated requirements more specific, certain performance goals for the Learning Resource System in 1980 have been assumed. However, there is nothing sacred about the numbers proposed. They are used only to aid in estimating the

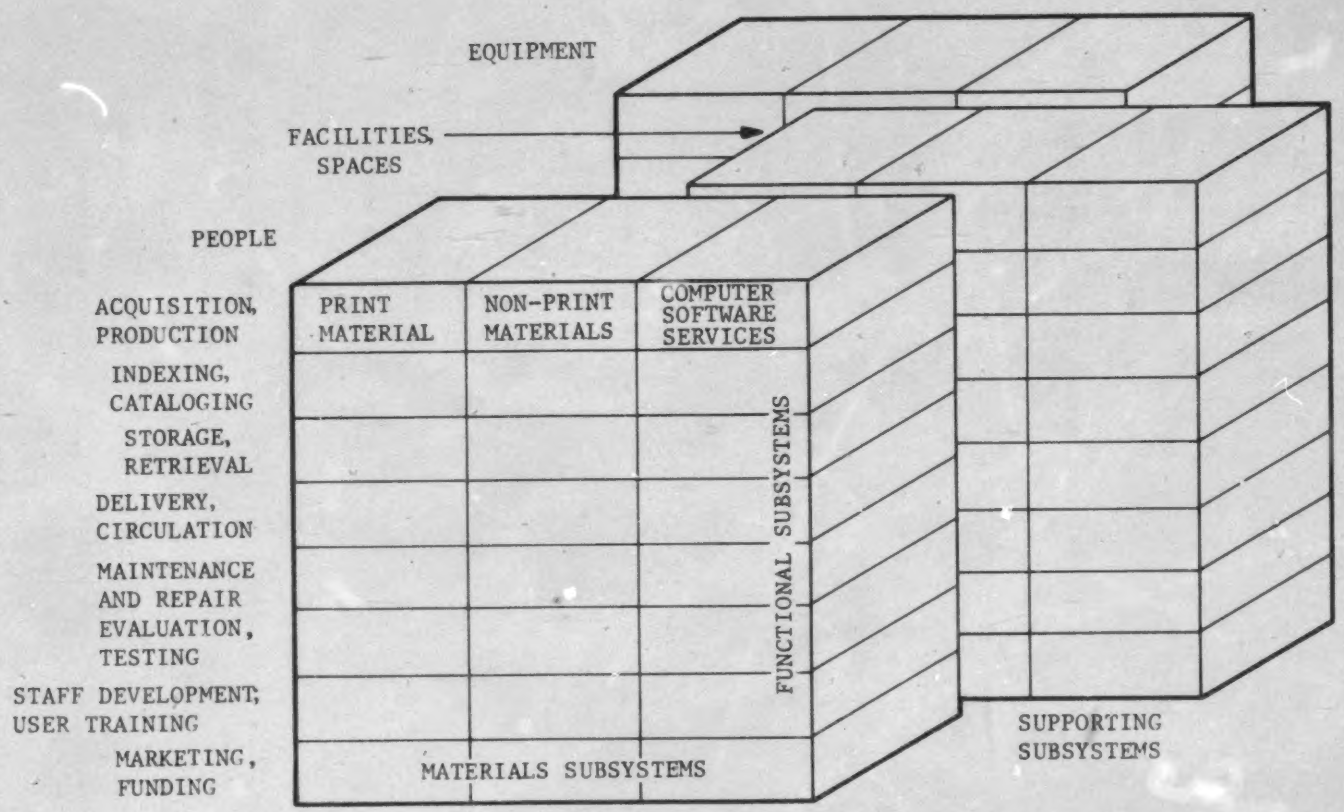

FIGURE 4

ONE SUPPORTING SUBSYSTEM, FACILITIES

size of the system under consideration, and would have to be revised during the detailed design process to suit the needs of the real system as it evolved.

The assumed performance goals, on which the tentative designs for the Georgetown Learning Resource System in 1980 are based, are listed below. They appear to be reasonable goals for planning purposes.

- Provide basic audio-visual service to all classrooms either with permanently installed equipment or with portable equipment stored in buildings other than the new academic building. It should be necessary for a faculty member to make only one telephoned or written request to obtain the service required.

- Provide sophisticated AV-TV services to several large lecture rooms in the new academic building. One of these should be a large auditorium that can be used as a theater, a center for multi-lingual conferences, and a general purpose auditorium. Four major dramatic productions, four multi-lingual conferences, and a number of other workshops, conferences, and lectures would be expected to take place each year.

- Provide study carrels with electricity and with audio, visual, or TV capabilities, in several different configurations, for approximately two-thirds of the undergraduate student body (that is, 3,000 students) to use for individual study at least an hour per day.

This goal would require 200 student carrels available 15 hours per day, or 300 available 10 hours per day, or some other combination that could provide 3,000 student-hours of access daily. The gradual replacement of today's language labs with new wireless multi-channel classroom broadcasters will mean that the language students may need fewer than the 150 audio carrels they have now for class instruction, but individual study will still be required, and as other audio-visual programs are designed and produced, the need for additional carrels will be felt.

- Provide, in addition to individual carrels, a number of small group (2 - 4 person) carrels or cubicles.
- Provide a number of class size spaces with AV/TV capability (audio input and output, video input and output, intercom); it is assumed that some of these could be used as part of a simulation laboratory complex part of the time.
- Provide several open areas that could be configured for different kinds of class activity.
- Provide production and production support services for the user community for students and teachers. A reasonable workload for 1980 might be the development of two one-semester courses per semester, plus the development of several mini-courses or course segments, and the provision of production support to several dozen student term projects or seminar presentations.
- Provide workshops, weekly, for faculty members and students who are interested in learning about equipment operation, principles of instructional design or production techniques.

To meet performance goals like these, planners must specify the types and sizes of spaces in which activities are to be carried on, and the types and numbers of people to do them. Table 2 gives a summary of facility requirements, while Table 3 presents a range of personnel requirements in summary form. Equipment type requirements are given in detailed tables in Appendix I, along with more detailed personnel information.

3.3.2 Learning Spaces

The delivery/presentation/use of certain educational resources requires special kinds of facilities herein designated "learning spaces."

TABLE II

FACILITIES SUBSYSTEM: SPACE REQUIREMENTS FOR A LEARNING RESOURCE SYSTEM

Types of Spaces	Number of Spaces
Learning Spaces	
Individual learning spaces - single carrels	138
Smaller group spaces - multiperson carrels	40
Larger group spaces - class size spaces	20
Display areas	1
Circulation control desk	1
Auditorium/conference/theater space	1
Large lecture theaters	1
Simulation-gaming laboratory space	1
Computer terminal space	1
Production Spaces	
Audio recording studio	1
Television Studio(s), Central Control Room	2
Graphic Arts Studio	1
Photography Studio	1
Model Building Studio	1
Rehearsal Spaces, Box Office and Theater Lobby	
Production Support Spaces	
Scene Shop for Stage and TV Productions, Storage Areas for Scenery	1
Woodworking Shop, to Support Stage Designs and Model Construction	1
Costume and Property Preparation and Storage Areas	1
Materials Storage for Graphic Arts and Photo Supplies	1
Other Spaces	
Maintenance/Repair Workshop	1
Engineering Test Laboratory	1
Administrative Office Space for LRC	1
Office/Work Space for Ordering, Cataloging, etc.	1
Materials Storage Space for Cataloged AV Materials, Programmed Texts	1
Eating-Drinking-Lounging Spaces	5
Utility Spaces/Mechanical Space	1
Outdoor Areas for Sociability, Classes	12

TABLE III

ESTIMATED PERSONNEL REQUIREMENTS* FOR A MIXED LRC SYSTEM

Types of Personnel	Number of Personnel
LRC Director	1
LRC Assistant Director	1
Clerical Employees	1-2
Acquisitions clerks	1-2
Production Technicians	
Graphic artists	2-5
Photographers	2-4
Audio recording technicians	1-2
Television, VTR technicians	2-4
Students-faculty	As required
Computer software consultants	2-4
Instructional designers	1/2 - 2
Indexing, cataloging	
Indexers	2-4
Clerks	1-2
Storage, retrieval	
Clerks	1-2
Delivery, circulation	
Clerks	5-8
Technicians	1-2
Maintenance, repair	
AV equipment engineers	3-4
Evaluation, testing	
Software-instructional designers	1/2 - 1
Equipment test lab technicians	0-2
Staff development	
Instructional designer	1/2 - 1
Technicians	1
Marketing, funding	
Administrators	1/2 - 1
TOTAL (range)	28 to 53

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*Non-print media and computer software support only; janitorial service for the LRC building not included.

They are an end point in the delivery/circulation subsystem. Because the learning spaces are the ones most immediately obvious to the faculty and student users, they will be discussed first. Following that, production spaces will be described, then production support spaces, e.g., materials storage areas for graphic arts supplies, and finally, "other" spaces related to the other activities of the learning resource system. All together, they make up the facilities subsystem, one of three supporting subsystems.

Although not many present classrooms meet the requirements below, all learning spaces should be carefully designed to provide proper conditions of temperature, humidity, and fresh air for human physical comfort and well-being. They should be acoustically comfortable, even when several groups of teachers and learners are located in nearby areas. Proper lighting for varied uses of the learning spaces is required, with accessible controls for users in each area.

The spaces for learning should be esthetically pleasing. One communication to the Planning Group pointed out that the outdoor areas surrounding the new building should be planned specifically with the idea of providing attractive spaces in which to hold outdoor class meetings when the weather is fine. (16)

Assignment of space in the new building would be the responsibility of the Main Campus Planning Committee of the university, not of the LRC Planning Group, although some of the designs for use of space tend to recommend that they be used by some group that has expressed needs for space of a particular kind.

3.3.2.1 Materials Access Area. This facility is probably what many people think of when one mentions a Learning Resource Center. The two terms should not really be interchanged, however, if confusion is to be avoided. A Materials Access Area is a place in which are located several different kinds of learning spaces in which various audio-visual, programmed, and other types of materials are expected to be used. The Learning Resource Center concept includes the materials access area, the areas for the production, storage, and delivery of instructional materials (including classroom) and the other space that supports the LRC functions. In the materials access area there are:

- Individual Carrels, single person learning spaces similar to the audio-visual carrels in Lauinger Library.

In typical carrels, there would be facilities for listening to audio tape cassettes and for viewing slides, and perhaps motion pictures, and video tapes. The slide viewers may be manually controlled or controlled by a signal on an audiotape that accompanies the programmed set of slides.

Other carrels, planned for less extensive use of audio-visual materials, might be provided with electric outlets for the use of portable cassette player-recorders or simple filmstrip viewers.

Still other carrels may be wired for a complete sound system. Microphones and headsets may be plugged into such a system, or used as receivers for a wireless system for listening and recording with other specialized equipment for local transmissions.

- Multi-Person Carrels, for groups of two to five students.

Small group study sessions are popular even in situations in which carrels are designed for just one person. It is expected that some number of carrels should be planned for multi-person occupancy, with extra earphone jacks for audio programs, and space for seating several students comfortably.

- Class Size Spaces, for groups of ten to twenty-five students.

A number of classroom spaces with capabilities for use of audio-visual equipment are required. Some, perhaps all of these, should be flexible in size. This implies the use of a large open space with movable partitions for subdividing the space to adapt to changing class size and functional requirements. These spaces should have at least the capability described in Section 3.1.2.2 for present up-graded classrooms. In addition, some, perhaps all, should provide the capability to tape (audio and video) the discussion or lecture and to deliver presentations based on audio and video tapes. Their capabilities should be equivalent to or better than the present classrooms in the Lauinger Library AV Department (4, 6, 11, 16).

Some of the classroom spaces may be equipped with wireless classroom broadcast systems. Students will use individual head sets capable of receiving a number of different broadcasts. It is expected that audio tape language labs, specialized as they have been for some years, will be used far less. Advanced students will simply obtain copies of an audiotape lesson to use at a standard audio listening carrel or at home on their own recorders. Beginning students will use the special wireless broadcast equipment and will be extensively monitored by teachers, while the advanced students are more likely to be asked to play their tapes in class or hand in the cassette on which they recorded their homework drills, so that the instructor can add comments and suggestions on the tape.

- Small Spaces for Models, Realia, Graphics. Sometimes learning resources consist of three dimensional models, or of examples of painting or prehistoric clay pots -- whatever might be found in a museum. If an instructor wishes to make such realia available to the students, some section of the Materials Access Area should be capable of displaying them attractively and safely.

There will be security problems with all the equipment and materials used in the Center, but since precautions will be in effect to prevent vandalism and theft, the area is likely to be an appropriate place in which to display realia.

- Circulation Control Desk. Because of the extensive amounts of equipment and materials that will be in use it will be necessary to have a single entrance and a control desk for signing out materials and also for checking students and others who enter and leave the space, at least the areas where the individual and small group study carrels are located. It may prove worthwhile to have a single building control point as the Lauinger Library does and to allow free access to areas of the building within the limits of the building control.

In the Materials Access Area, it will be necessary to have several staff members to circulate materials, assist students who need help in using the equipment, and generally to supervise the study area to make sure everything works properly.

Performance requirements for the installed equipment mentioned for use in the study area are relatively simple; the equipment should work, most of the time, without undue effort on the part of users. The maintenance estimates are discussed elsewhere. The performance with respect to the number of students that can use materials for some length of time each day is a crucial estimate that affects the building design.

If we assume a student population of 4,500 undergraduates, and estimate that each student will use an individual study carrel one hour per day in a place that is open 15 hours per day, there would be a requirement for 300 carrels, for a steady flow of students throughout the day. If each student were expected to use individual materials for only 30 minutes per day, only 150 carrels would be required.

At Georgetown, not all students will use self-paced materials with audio-visual support. Some will use them for more than a half-hour at a time, and the stream of users throughout the day will probably not be steady. If the need for carrel space becomes a problem, scheduling could be considered as an expedient for managing a bad situation, but much of the value of self-pacing comes from student motivation and students' responsibility to plan their own work. The School of Languages & Linguistics already uses approximately 150 carrels much of the day. Probably space for about 200 individual carrels and about 20 or 25 multi-person carrels should be planned initially, with additional space reserved for possible expansion when it is required. Widespread use of individualized materials is not likely to sweep the campus overnight; in fact, initially, the demand will be small because there are not yet very many courses designed to use these materials. However, as the course materials are developed, their use will surely increase.

Because class size learning spaces with extensive audio-visual equipment will be in demand, scheduling these spaces will probably be necessary. It should be the responsibility of the Center staff, based upon the extent to which an instructor uses teaching materials that require the audio-visual support. The teacher who is just looking for a more comfortable classroom space may thus be motivated to get acquainted with the possibilities of using new techniques.

3.3.2.2 Specialized Learning Spaces

- Auditorium/Conference/Theater Space

One very large room (400-500 seat capacity) should be available to support the needs of several special groups. One group would use this room as a theater (10, 17); adequate stage, lighting, acoustics and multiple modes of media origination and delivery, including television origination, are required. The other group desires to have the use of such a room for a multi-lingual conference facility (4) and requires an appropriate sound system and a separate area that could be adjacent or located elsewhere in the building for simultaneous translation. The conference space could use, for providing the simultaneous translations of the proceedings to members of the audience, the multi-channel broadcast techniques that will be used in the language teaching situations. The simultaneous translators can be situated anywhere in the building; full television coverage of the stage area must be provided by remotely controlled TV cameras. The translator has to be able to observe the facial expression and gestures of the speaker; using television for this would also make it possible for the School of Languages and Linguistics to develop a library of edited or unedited videotapes of the conference proceedings (a) for distribution to other universities, and (b) for the use of the linguists SLL in training in simultaneous translation.

When not in use for either special purpose, the room should be convertible for use as one or more large lecture rooms. This space is envisioned with such multi-functional capabilities because the special uses can be scheduled in such a way that a wide variety of other activities would be able to use it as a general purpose auditorium. It would sometimes be used for some of the many conferences and workshops conducted by the university. Just because it has traditionally been used as a restricted purpose facility, there is no reason that the Hall of Nations must remain so. New technology now permits the specialized functions performed in the Hall to be performed in any conference facility that has remote TV capabilities. Likewise, many other functions could be performed in the Hall if it were modified into a multi-purpose facility.

The drama group has special needs, in addition to an auditorium, for spaces that probably would have to be allocated on a more-or-less permanent basis. Space for scenery construction and storage, dressing room space, costume storage space and rehearsal space could be planned for the use of the dramatic productions and for others who might want to make television programs. A lobby area with small box office/coat room is also part of the complex. If sole ownership of such space were very important to Mask and Bauble, the suggested arrangements might not be suitable, although it does not appear to be very different from the rental use of Trinity Theater.

- Audio-Visual Lecture Rooms

Several smaller rooms (150-200 capacity) should be available to be used mainly for the meetings of large classes (11, 12, 17). Each would be equipped with audio-visual delivery capabilities comparable with those previously outlined for large classroom spaces, and would probably have slightly sloped floors to improve visibility. One or more of them should be equipped with TV monitors for delivery of videotaped materials or commercial broadcasts or other TV presentations, and with TV cameras so that the room can serve as an origination point for programs.

Many faculty members have expressed the desire to have some kind of lectern-mounted control panel for all the AV equipment in the lecture hall. The large lecture rooms should also have sufficient stage-like space for the presentation of in-class theatrical productions, readings from plays, psychodramas, and other such activities (11, 12, 17).

- Simulation Laboratory Space

An additional area should be set aside for use as a simulation laboratory (10, 13). It should accommodate small groups, and support the development, discussion, and documentation of various models. One proposed use of such a facility would be gaming in international politics simulations (13). Another would be for studying various urban models, discussed at some length by the Economics Department.

Several small rooms, or visually and acoustically separated areas, each large enough to hold about ten people, would be required. It should be possible for observers to monitor some of the isolated spaces, either via one-way mirror observation spaces or via closed circuit TV. The CCTV would probably be preferable because the observations could simultaneously be recorded on videotape for further study. Remotely controlled CCTV cameras similar to the ones used in retail stores to discourage shoplifting could be used for the observation and recording.

As noted above, many classrooms in the LRC may be equipped to record and/or deliver audio-visual presentations. Concurrently, the LRC must have technicians available to perform that recording/delivery upon request (3, 4, 7).

In addition, the capability to produce audio-visual presentations for later use, either in or out of class meetings, must be available in the form of technical assistance (4, 6, 8, 9, 11) and appropriate space and equipment. All of these resources should be available to students as well as faculty (6), for use in the preparation of audio-visual presentations as segments of papers, oral exams, dissertations, and the like. The question of whether or not such a presentation is appropriate to fulfilling a particular academic requirement is, of course, up to the individual instructor and student to decide.

Service and development capabilities of the Center must be flexible. Cause will occur from time to time for experimentation with novel learning modes and techniques (5, 7). An area for such experimentation must be continually available, as well as the means for calling in experts to observe and advise in such experiments.

Additional personnel will be necessary to aid interested instructors in the selection, design or procurement, and implementation of course work which has been adapted to media-based presentation or computer usage. Of course, the evaluation of such materials for a particular course, as well as the decision to use them in the instructional program is strictly in the hands of the instructor.

3.3.3 Production Spaces

A number of specific production space requirements are discussed in the following sections.

3.3.3.1 Audio Recording Studio; Tape Duplication Facility. Faculty members who wish to prepare taped lectures and language exercises require the support of an audio recording studio, acoustically engineered for good sound reproduction. Students may also wish to prepare tapes for classes.

Rapid duplication service for reel and cassette audio tapes is required so that multiple copies of lesson tapes can be prepared. Editing and duplication equipment will thus be required. It is expected that the increasing use of cassettes will tend to make reel tape recorders obsolete very soon.

3.3.3.2 Television Studio. In addition to the auditorium/conference/theater space and the large lecture rooms that can originate TV programs, at least one studio with relatively inexpensive non-commercial broadcast equipment will be needed. A central control room adjacent to the TV studio that can record on videotape or audiotape any presentation in classrooms, in the auditorium or in the TV studio and an adequate production staff to manage the volume of instructional media as it evolves, will be necessary.

3.3.3.3 Graphic Arts Studio. Space, personnel, and equipment for a graphic arts department will be required. If the History Department wants ten maps showing the extent of the Roman Empire at various periods, for use with an overhead projector, the material may be drawn by the graphic designer. The drawings could then be photographed to make transparencies for use with the overhead projector. The series of maps might be the kind of product that should be marketed to historians at other universities to defray the cost of producing them at Georgetown and to support the production of more teaching aids.

3.3.3.4 Photography Department. This department requires space, personnel, and equipment to make 35mm transparencies, overhead transparencies, film strips, motion picture films, and self-learning cassettes using a variety of techniques. Areas for copying, for darkroom facilities and other photographic work are needed. The TV studio would be used for cinematographic production. Some technicians to serve the facility with these time-proven aids are needed to start this activity.

3.3.3.5 Model Building Studio. The Department of Medical-Dental Communication has a staff member who has spent several months creating large (three feet across) models of selected teeth for use by the Dental faculty as aids in teaching morphology of teeth to dental students. Three-dimensional models might be very useful in many disciplines; biologists could request models of organelles; physicists of molecules; models of Shakespearean theaters might help modern drama students to envision problems of stagecraft.

A small area similar to that at the Medical Center should be reserved for this kind of activity.

3.3.3.6 Rehearsal Space, Box Office, and Theater Lobby. Dual purpose rehearsal space that could also be used for dressing rooms when the production moved to the auditorium stage should be provided for the dramatic productions. Box office space should be accessible from the building exterior, as should the lobby space. Conference center/auditorium security must be planned with these considerations in mind.

(Personnel estimates for dramatic productions were not included in Table 3 because they are not expected to affect the LRC staff size directly.)

3.3.4 Production Support Spaces

These spaces are designated as support areas for the activities of learning resource system production in a rather broad sense, and consist primarily of office space, storage space, and work space for those activities that directly support the production or use of materials.

3.3.4.1 Ordering, Indexing, and Cataloging. Acquisition, indexing, and cataloging require office space and office equipment. For original indexing of films and other AV materials, viewing and listening space and equipment are required for the use of the indexers.

The desire for an automated selective bibliographic search capability, to be used by students and faculty as an aid in course work and research, was expressed (6, 9). This kind of capability would also be very useful to the acquisitions department and to the indexers. If an automated index were provided, this work area would need a computer terminal to access the bibliographic data. (It is assumed that print and non-print materials would be entered in a central catalog).

3.3.4.2 Storage. Special spaces will be required for the proper storage of a number of special kinds of materials and equipment. Stage sets and scenery present probably the greatest problem in volume storage, while microfiche materials are at the other end of the scale in size.

Storage areas must be planned in the system to support at least the following kinds of things:

- Materials and supplies for production of graphics, and of three-dimensional models.
- The models themselves, and realia
- Stage sets, and theater properties
- Audio-visual equipment of all kinds
- Cataloged materials: films, audiotapes (reel and cassette), microfiche, microfilm, slides, videotapes
- Instruments and equipment for production

3.3.5 "Other" Spaces

3.3.5.1 Maintenance and Repair Workshop. Space, equipment, and above all, engineers and technicians are required to keep the facilities and equipment of the learning resource system in operational condition. A workshop area where equipment can be disassembled, tested, and put in working order will be necessary. Test equipment and tools are required.

Some office space is required to handle the administrative aspects of the maintenance department, such as keeping records and processing requests. Some equipment may be maintained under contract by suppliers; the maintenance supervisor would be responsible for monitoring the performance of such contracts.

Equipment testing and evaluation could take place as a parallel activity of the maintenance and repair activity or as a separate function, developing into an engineering testing laboratory that could produce reports of its results for the benefit of Georgetown University and for the educational community at large. This activity could probably be funded from outside the university.

3.3.5.2 Evaluation and Testing (Software). It may be desirable to designate some small portion of the Materials Access Area as a place for software testing and evaluation. The function will be performed, but its location does not have to be specified. The personnel involved in the evaluation would be part of the instructional design staff, but the evaluators should not be the same people who designed the materials.

3.3.5.3 Staff Development/User Training. Since there will always be a certain amount of training going on in the LRC, no special areas are to be set aside for it. Students who want to learn to make videotapes will use the space and equipment available for that purpose. If there is instruction in making documentary films, the session will meet in the photography area. Informal faculty workshops in instructional design will meet in one of the classroom size spaces. It is not expected to be necessary to allocate special additional spaces to this activity.

3.3.5.4 Office Space. Office space for the LRC staff and the support services staff for the entire campus-wide delivery system of instructional support is required, and could probably best be located in the LRC, although not all the functions of the Learning Resource System will be located there.

The marketing activities related to selling the products of the LRC to publishers (or to marketing them directly if the University chose to produce materials in quantity), will require space. Obtaining funds to support development of new learning materials also involves office work and secretarial support. The staff members engaged in these activities would not have this as a full-time responsibility, and would have other functions as part of the staff of the Center. Therefore, they should probably have their offices in the LRC building, although they would work closely with the Development staff in this particular activity.

3.3.5.5 Food Service, Utility, and Support Areas. Students and faculty members have mentioned the desirability of having access to this building at most hours of the day and night. They desire some kind of food and drink service -- perhaps from vending machines -- available whenever the building is open. Eating and drinking in the learning spaces is probably undesirable from the point of view of keeping the materials in good condition. These activities should be confined to an attractive Commons area where people could sit at tables or stand around and talk. It should be outside the learning space area security control point, accessible to the outdoor areas and to the lobby of the theater/conference space.

Building utility and support spaces should be placed where they will interfere as little as possible with the activities of students and teachers and still be convenient.

3.3.6 Control of Space Assignments

The amount of classroom space in the LRC building will not accommodate everyone. Because it is likely that there will be competition among the prospective users of some of the new learning spaces, the learning resource system must include plans for equitable means of assigning spaces on a temporary basis without losing control of the facilities or equipment it manages. The Lauinger Library audio-visual classrooms are an example of this kind of scheduling at the present time. The Library controls the space; any faculty member from any department may request the space on a first come, first served basis. The LRC will have more spaces of more different types to administer, and therefore a somewhat more complex problem.

- Learning Spaces

Unless the demand for individual and multi-person carrels is overwhelming, student use on a first come, first served basis is preferred.

Class size spaces must be assigned on the basis of need, so that teachers who expect to utilize technological aids extensively and to make them part of the instructional program will have to be given priority in the scheduling of the large and small class spaces.

Display space for special materials will also have to be scheduled, but unless demand is very strong, the scheduling can be relatively flexible. Priority should be given to materials that are directly used in the instructional program at a particular time.

The auditorium/conference/theater space may be allocated as much as 18 to 24 months in advance, especially for use as a multilingual conference facility. These meetings will probably not occur more than 3 or 4 times a year, but the planning for them is done well in advance.

Twenty to thirty workshops, conferences, Bankers Forum meetings, etc., will be accommodated each year, as well as major speakers invited by student organizations about once a week through the academic year.

Mask and Bauble productions, requiring less lead time than international conferences to schedule, will be fitted in when conferences are not scheduled, and can be expected to run for about one week at a time. The drama group would like to be able to produce four major plays annually, and two or three short plays. Although the specialized space would be shared, it probably would not often be available as just an auditorium. The special theater/TV capabilities would not be required by, and would not be useful to, a group that just needed a sizable auditorium.

The large lecture rooms, like the classroom spaces, would be assigned to the instructors planning to make the most extensive and effective use of their capabilities. Simulation laboratory spaces would similarly have to be scheduled with priority given to the effective use of the spaces. Some of these decisions will have to be made by the LRC Director, because that person will be in a position to make them with full knowledge of the uses made of them.

The point here is that no longer is classroom space to be assigned merely on the basis of room capacity and class size; rather, it depends on what group can make the best educational use of a particular space at some time. Most classroom assignments would still be made by the University Registrar, but the assignments will depend on the type of use, and the Registrar may wish to have recommendations from the LRC Director in some cases.

- Production and Other Spaces

Production spaces will be assigned to various parts of the Learning Resource System or to outside user groups like Mask and Bauble (scene shop, rehearsal space) or to individuals such as faculty members or students producing materials, on a short or long term basis by the staff of the LRC. Some spaces in other buildings may be inventoried as part of the LRC facilities inventory without being under LRC control, so that alternative sites can be recommended for activities that can not be accommodated in the LRC.

3.3.7 Modules of Physical Space

Although the site for the LRC building has not yet been selected definitely, the Planning Group understands that the approximate dimensions of the building are expected to be about 270 by 175 feet, in four floors. In a very sketchy fashion the Planning Group proposed some modular space allocations and presented some traffic considerations that affect the overall academic usefulness of the building. The sketches in this section are not architectural drawings, and deliberately are not joined together. They are shown as modules that are important in their relationship to the other modules, but the relationships could be preserved in some other building arrangements.

The level containing the large auditorium/conference area should be accessible from the exterior of the building, perhaps a half-floor above ground level, or entered by a ramp or bridge from the ground level, to enhance its openness and accessibility. Figure 5 shows a sketch of a possible arrangement with a large auditorium, large lobby and box office, snack bar, and student lounge areas adjacent. Small tables in a snack bar area could serve theater patrons as well as students studying in the building, and might even be a source of revenue for the LRC, although this possibility has not been considered seriously. It seems more likely that this is similar to the retail sales activity of the bookstore, and not an LRC function.

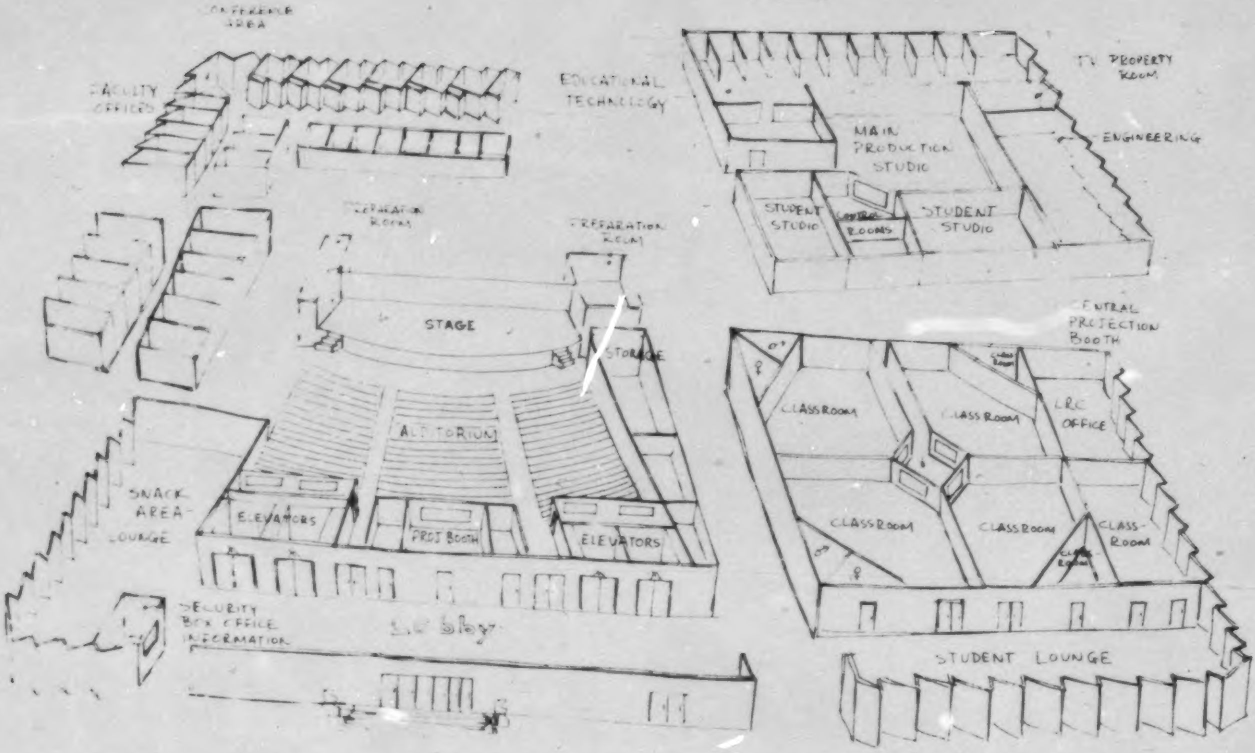

FIGURE 5

SKETCHES OF AUDITORIUM LEVEL MODULES

In addition to the auditorium, there should be space for scenery storage, and a master TV studio and two smaller studios for audio recording or TV, located away from the exterior walls of the building. The LRC offices and the engineering department (maintenance and repair) should cushion the studio area from exterior noise and vibration.

Also on this level there should be a complex of large audio-visual classrooms. Four of them are shown located around a central core that would contain equipment for rear-screen projection of films and slides. The equipment installed in this central core could be operated by one or two technicians, or could be set up by the technicians to be operated by professors from remote control lectern panels wired to the equipment. An advantage to having the equipment in the central core, in addition to the improved security, is the ease with which the technicians can set up presentations for more than one class at a time. An LRC office and another small classroom insulate this area from noises outside the building.

A number of faculty offices would surround the auditorium and stage areas, on this level and the one above. Because the auditorium and the TV studios must have high ceilings, the mezzanine floor is not built over those areas. In addition to the office spaces, the mezzanine level could contain a faculty lounge, several classrooms around the periphery of the building, and the photography and model production area for the LRC. An observation room above the master TV studio, overlooking the TV production floor, and an office for the TV technicians could also be located at this level. (Figure 6).

Assignment of the faculty offices, and indeed all decisions regarding space allocations in the new building are the responsibility of people other than the Planning Group. However, in some cases, it may make sense to allocate office or classroom space contiguous to areas that will be used primarily by one group or

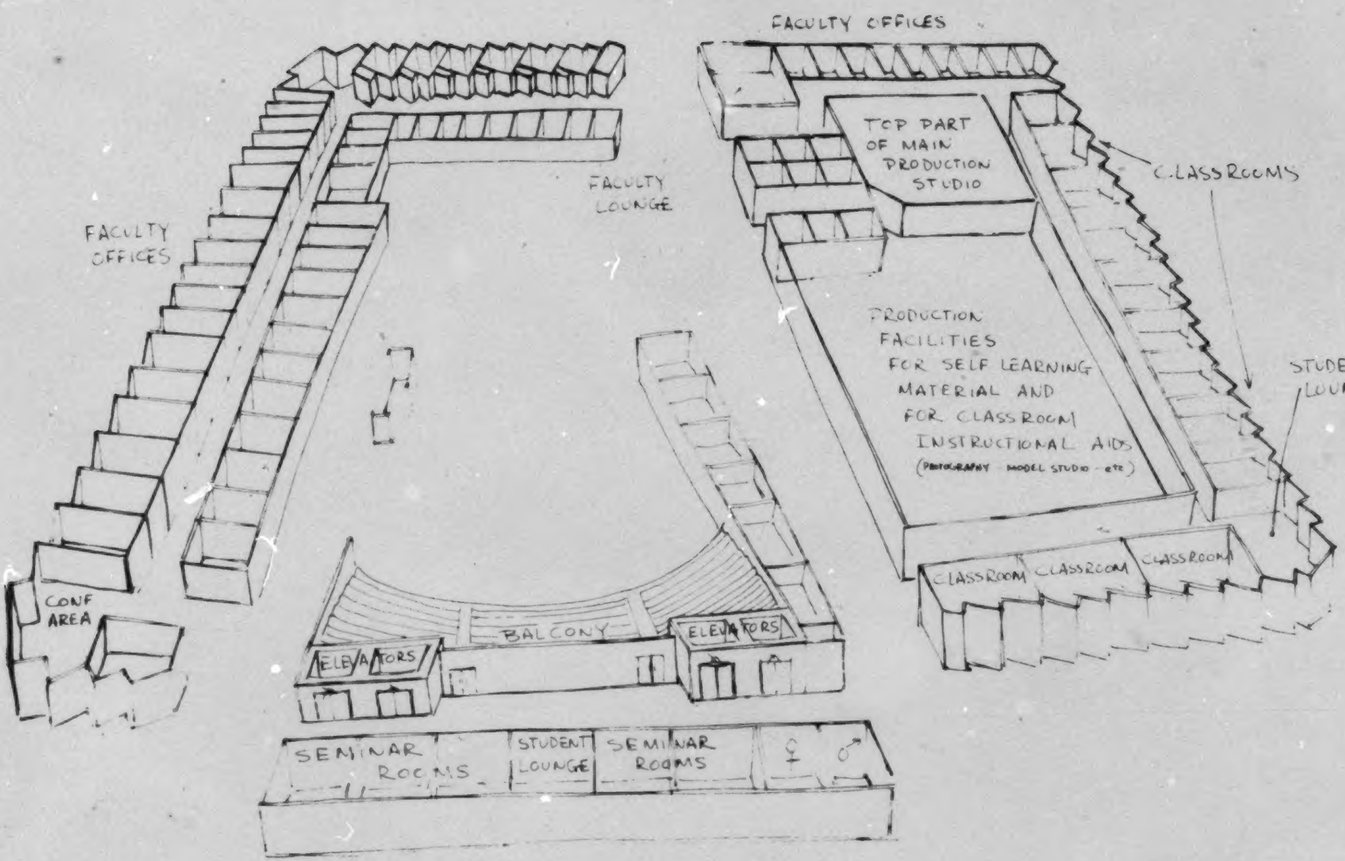

FIGURE 6

SKETCHES OF MEZZANINE LEVEL MODULES

another, and in those cases, suggestions are made. The LRC offices, for example, should be readily accessible to faculty and students, and should therefore be on the main entrance level. The TV technicians' office must be close to the TV studios.

On another floor of the LRC building, shown in Figure 7, -- a floor which could be at a lower ground level below the auditorium, or on a level above the mezzanine level -- would be located a lounge, some projection rooms, the Materials Access Area, and a number of small rooms (about 12 ft. by 16 ft.) that could be used for very small classes. Many of them would be wired for both audio and video input and output, and an intercom system. Several of these small rooms, with remotely controlled TV cameras and a control room with TV monitors, could provide the capability of the simulation laboratory complex discussed earlier. When not used for the simulations, they could be used as ordinary small class spaces.

The Materials Access Area is the most important feature of this level. The Planning Group believes that this area should be very easily accessible, and recommends that it be placed so that its entrance can be at or near ground level so that students will enter it very readily. Learning materials storage space would be located at the center of the area, with a number of individual carrels and cubicles for one to three students surrounding the center. The circulation desk would serve as the access control point for the study area, which provides seating for about 360 students, plus a large group meeting room, two preview rooms, and a soundproof room in which computer terminals (which may be noisy) could be located. Additional office space and classroom space would be located on the periphery of the building at this level. Office space (not shown) would be required for acquisitions, indexing, and cataloging activities, related to the Materials Access Area.

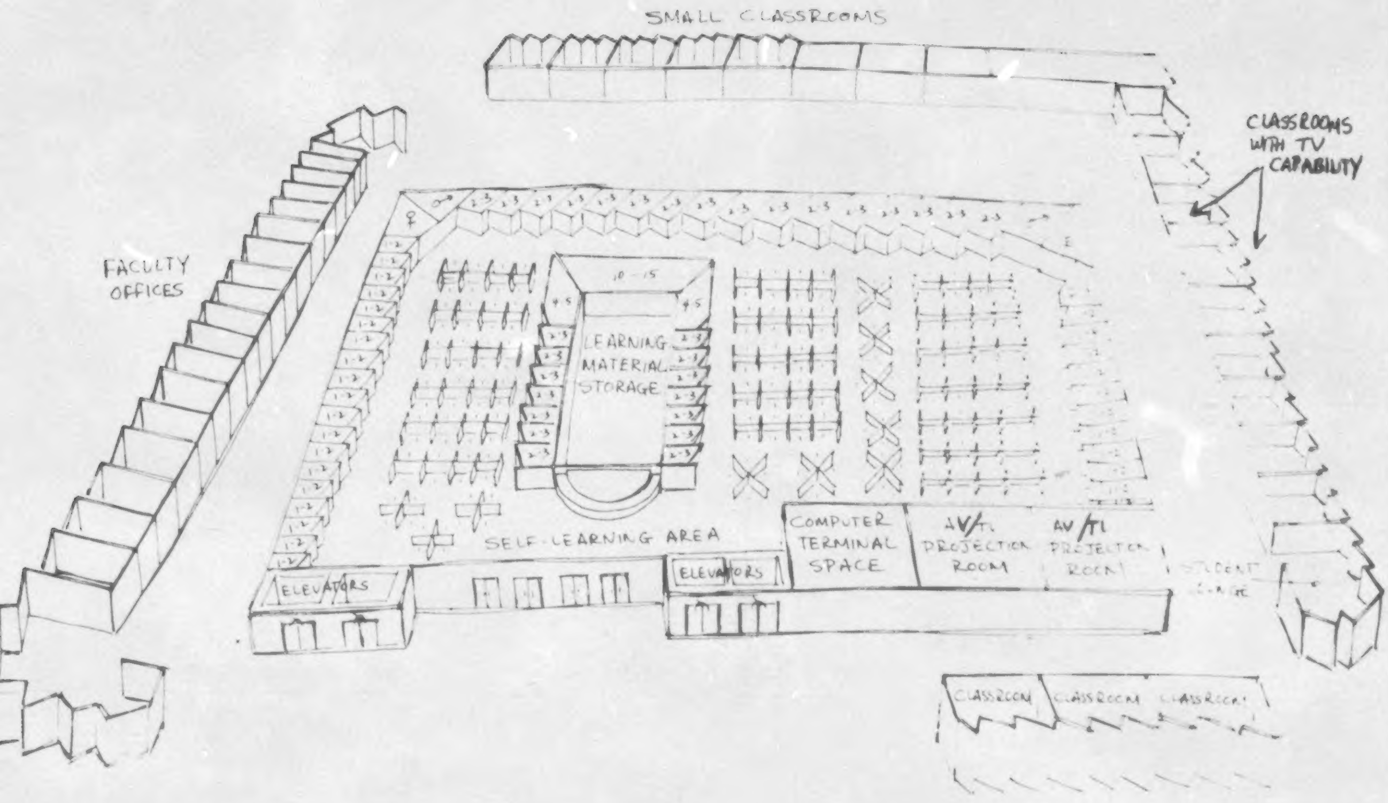

FIGURE 7

SKETCHES OF MATERIALS ACCESS AREA LEVEL

Since the exact sizes of the rooms and their layout are the province of the architects, the Planning Group does not give any specific estimates of numbers of square feet of area devoted to each kind of activity. Such estimates could be made easily from the initial architect's drawings, and are not attempted here. Requirements for types of space (number of carrels, etc.) were given in Table II .

A building incorporating the features described above would provide spaces for achieving most, if not all, of the performance goals given in Section 3.3.1. More space for students could be provided by locating some of the faculty offices in other buildings. The number of carrels in the materials access area may be small initially, but the expectation of increasing their number gradually must be reflected in the amount of space allocated for their eventual occupancy. If the site permits, and building height is not a problem, consideration could be given to the possibility of later expansion of the building itself to more than the four floors tentatively planned for the initial configuration.

The Planning Group's best guess as to requirements for some of the modules required in the new building have been presented here, with the hope that these ideas may be useful to the architects, whom we look forward to meeting in the near future.

4.0 OTHER CONSIDERATIONS

In this section, some of the design constraints on a Learning Resource System are described. They consist primarily of valid concerns for the status quo at Georgetown. Nobody likes change and especially not change that affects one's individual ways of living and working. Therefore, if one is to change, there must be some reward involved that outweighs the costs and pain of changing.

Some changes may appear to be just too costly in terms of the values at Georgetown University. They are very real constraints on the alternative feasible system designs, and must be examined because they help to gain an understanding of the decisions made in proposing feasible systems.

The constraints and environmental considerations discussed below are described from the system design point of view, with no intention to praise or blame the conditions described, but rather, to see them in perspective. No criticisms are implied or intended.

4.1 Finance Considerations

The faculty has raised some serious questions regarding the financing of the proposed Learning Resource Center (LRC). They are concerned that equipment, personnel and facility costs of such an undertaking may drain off from the rest of the University resources which are urgently needed for other purposes. In addressing these questions it is necessary to address the overall cost situation as regards the entire Learning Resource System of which the LRC is to be just one part.

The several functions of the Learning Resource System were identified earlier. It is important to note that many of these functions are already being performed by one or more organizational elements within the Georgetown structure, usually for a limited group of clients. There are, for example, several media production facilities (photo and recording studios and labs), extensive printed materials resources in the libraries and a wealth of audio-visual equipments and special instructional and learning aids. These resources are now being carefully inventoried in order to determine their extent, condition and degree of availability to the future system.

Reorganization and redirection of present learning resources activities are expected to result in some increase in productivity of these activities. They will be capable of providing more products and services to the Georgetown community than before, even at substantially the same budget levels as at present. It is doubtful, however, that the increases in productivity developed in this manner will be sufficient to meet the rapidly growing needs of the faculty and students in the coming years. Some additional capital investment will be required and there will also be a need to increase the operating budget.

The major capital improvement required will be the Learning Resource Center building. The construction of this building is a special case. Other capital items which will have to be funded in some other way will include investments in media production equipment, delivery equipment (projectors, screens, players, etc.), file and storage equipment, and long-term investments in faculty and staff training and development. A substantial capital investment will also be required in building up a store of media materials for use. Master and loan copies of each media item to be used will be required. The capital investment in this area will be comparable to that required in developing a new, special library.

The principal increase in operating costs will be the salaries of any additional individuals required on the staff as part of the Learning Resource System. That portion of faculty salaries which covers time and effort put into developing new media materials for use in the system will also be ascribed to system operating costs. The costs of consumable supplies used in creating new media materials will be another operating expense. Still another significant cost will be the cost of maintaining and refurbishing increased quantities of more complex and sophisticated equipment and instructional materials as they are needed. The increased cost of overhead items such as clerical support, power, water supply, air conditioning and other similar items must also be considered.

Although the additional costs of the new system have not yet been determined precisely, a plan has been developed for generating income to cover any increased capital and operating expenses. At least five sources of additional income have been identified:

- Grants
- Sales of Media Materials
- Sales of LRC media production services
- Corporate/Individual gifts
- Growth

Grants have always been a good source of "seed money" to get projects like the LRC underway. The developments at G. U. have attracted the attention of several possible sources of grant funds including the U. S. Office of Education and several private foundations interested in educational innovations. It appears likely that grants will be available to cover selected developmental projects in connection with the LRC.

Faculty members will be encouraged to team up with the LRC staff in grant funded projects to develop new resource materials. In these situations the grants may be obtained either by the faculty members or by the LRC staff. Projects might include such efforts as: (1) developing modules of a self-paced course in the history of psychology; (2) developing special media materials for educating nursing students; (3) preparing adult education materials for use in specialized programs sponsored by the School for Summer and Continuing Education; (4) preparing and presenting periodic radio or television programs such as the Forum; and so on. The grants would cover all expenses of the work performed and would pay some of the fixed costs of the Center. The materials developed would become available to the Georgetown Learning Resource System and could be used as desired.

The sale of media materials produced at Georgetown would generate some income. The Georgetown faculty is already active in producing textbooks, and other conventional publications. The University LRC with the help of the faculty can become a modern-day publishing house for media materials. Some of these materials will be originated by Georgetown faculty, others by the faculties of other schools which are not equipped for their own production. If an effective marketing program can be developed the LRC will generate royalty income for the faculty and direct income for the Center through sale of the materials produced.

In some cases the Center may also sell the services of its production crews and rent out the use of its studios. Such arrangements could be made with other universities, schools or public interest groups on a cost plus fee basis. The work performed in this mode would be helpful in filling any slack time and would provide some additional income (fee) to cover experimentation and research activities at the Center.

The mere existence of the LRC as a site for demonstrating new methods and materials in teaching should be an aid in attracting additional corporate and individual gifts. The University Development staff can focus on the activities of the Center, much as they have with the new libraries, and encourage donors to aid specific, high impact or high interest activities. The media services of the LRC may also be useful to the Development staff in preparing more effective mailings, displays or programs to improve communication with potential donors.

The proposal to finance some of the future Learning Resource System by growth is, at best, a touchy question. Already the faculty members feel overworked and the students are complaining that the faculty spends too little time with them directly. Participation in the development of new media materials to be used in the new system will be an additional drain on faculty time. It therefore appears that this would be a limiting factor in any consideration of enlarging the student body at any time during the initial period of heavy investment in materials development. After the initial investment period, however, some growth in the undergraduate and graduate student body appears to be reasonable given the appropriate increase in faculty and other resources at that time.

4.2 Incentive to Participation in Instructional Development

Just as students respond to curriculum requirements, grading systems and other academic rules and regulations, so too does the faculty respond to the reward system of the university. Whatever the vagaries, this is most clearly spelled out in the faculty handbook in the section related to rank and tenure. On a more immediate daily, weekly, semester or yearly basis, the things the university prizes and rewards have an impact on the professor in terms of teaching load, research grants, committee appointments, secretarial and assistantship help, and salary increases. Probably there is not a faculty member alive who can not parrot the tri-partite criterion of judgment: "teaching, research and service." All look to excel in one or two and at least not fall too far behind in the others.

Aside from a clear recognition of the power and control of the university's reward system, it must be recognized that most professors are also influenced by a second set of standards - that provided by professional societies and extra-university colleagues within each discipline. The two competing reward systems overlap and are most easily reconciled in the area of research. When a university wishes to stress either service or teaching it must recognize not only that this must be clearly articulated in the university's list of merit awards, but that to some extent the university's rewards and goals are antagonistic to the competing professional recognition of research; which is the traditional criterion of excellence maintained by most professional associations. The shared goal of research makes the job easier in most graduate programs and schools like Johns Hopkins, Stanford, and Harvard. The faculty member is also less schizophrenic than one attempting to satisfy two competing systems. Universities which decide to stress teaching must not only accord it a high place, but also must recognize that they are competing for the time of a person whose professional rewards are in part probably in a different area.

If the need to reward teaching (especially innovative teaching) is clear, then the mechanism of what method and technique of recognition to use is an administrative policy decision tempered by economic realities. An administration that says, "I wish my faculty would experiment with new teaching methods, but we can't explicitly reward it or recognize it," either isn't really committed to teaching or is naive. All the rules and regulations of the university are there to support, in fact to produce, whatever is desired. Depending on the seriousness of administrative policy, all the things that have been mentioned are available: rank and tenure rules, salary increases, released time, secretarial and assistantship support, research grants, committee appointments,--all the trappings of academic success.

A combination of policy and economic considerations might suggest the following steps if the goal is to encourage an increasingly innovative faculty at the least cost:

1. The rank and tenure rules should include some comment that successful innovation in the teaching area will receive extra recognition.
2. To stimulate innovation for a three year period, some reduced teaching loads, some paid summer periods, and/or some paid workshops should be available, as should be

significant secretarial and assistantship help. This is intended to encourage initial production and to provide a climate favorable to innovation.

3. Since the impetus of the initial period would be costly to maintain, it should become a continuing policy to reward, with bonuses or salary increases, those who develop and demonstrate successful innovation courses. Materials that could be sold to other universities or publishers for distribution could also provide continued rewards in the form of royalties if such arrangements were worked out.

It is a question of policy whether the university wants, and can afford, such a program to encourage innovation in teaching.

The incentives for university change, then, may come from some group other than the faculty as a whole or from the administration as a whole. James Harvey sees the structure of a university as essentially one of competition among three basic interest groups: faculty members primarily interested in professional growth; students interested in personal growth; and administrators, chiefly concerned with plant maintenance and public relations. The undergraduate curriculum which has experimented with flexibility but undergone "no substantial changes to major programs since the beginning of the century"[3] has not been reformed because of a lack of consensus about the purpose of higher education. He states that curriculum reform requires a massive effort, and that it seems "essential, if curriculum reform is to take place, that three factors be present: (1) more faculty interest in both the needs of the undergraduates and in teaching freshmen and sophomores; (2) a better understanding of the relationships between the curriculum and other aspects of undergraduate education, such as grading; and (3) on-going review and evaluation so that curriculum reform measures do not become tomorrow's curricular crisis."[4]

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[3] Harvey, James. "Reforming Undergraduate Curriculum: Problems and proposals." ERIC Clearinghouse on Higher Education. Georgetown University, Washington, D.C. p.6.

[4] Ibid., p.8.

Whether pressures for more widespread curriculum reform would be generated by the modest changes being considered in the presentation of some courses at Georgetown is impossible to predict, some faculty members might regard this as a negative incentive.

Certainly there are possibilities for greater faculty satisfaction through participation in instructional design for whole programs of studies, opportunities for increased personal growth for students and for increased satisfaction in varieties of possible teacher-learner situations where time becomes less important and the quality of learning more significant. It may be a question of providing sufficient tangible rewards for change to allow enough change to take place so that the intangible rewards become obvious, and serve as incentives.

4.3 Personnel and Organization

A principal constraint in the development of any new organizational entity within the university is the previous existence of other organizational structures with which the new one must interact. The decisions that must be made with respect to the Learning Resource Center personnel and their place in the Georgetown University organizational hierarchy will lead to some changes and adjustments in the existing organization.

Problems can arise from a number of factors. If the LRC were seen as a threat to the traditional operation of the Library, there could be less than full cooperation of the Library staff in what might best be conducted as joint enterprises. If faculty members thought that their department budgets were affected in a negative way by allocation of funds to the LRC, their cooperation might not be won.

Initially, an interim organizational structure has been proposed (see section 3.2). The Chairman of the Committee on Educational Technology and Mass Media, with the support of the Academic Vice President, is to coordinate some activities that might become nuclei for a maintenance and engineering service, a delivery system for equipment and materials and a rudimentary production support service.

It is the belief of the Planning Group that a Director for the Learning Resource Center should become part of the university staff at an early date to direct the planning effort during the detailed design and the implementation phases. The organization of people that will become the LRC staff should begin to function prior to the building of the new building, because there is work for them to do now. The skeleton of the new organizational arrangements should begin to take shape, following a plan for its integration into the university organizational structure over the next two or three years.

In Section 5, alternative systems are presented. One is probably not feasible because its implementation would require such important organizational changes. Others, requiring less sweeping changes in existing organizations, may be possible. The most highly cost-effective system does not appear likely to be feasible from the organizational viewpoint, although others, quite similar but less radical, may be.

4.4 Control

4.4.1 Educational Control

Control of the educational program and requirements for the various degrees offered at Georgetown rest with the executive committees of the various schools. These committees are made up of faculty, students, and administration. Representatives are drawn primarily from the schools, but individuals from other departments serving the schools are also included. These executive committees possess a constitution which has been approved by the Academic Vice President and ratified by the Board of Directors. In addition to the executive committee, each school possesses other committees such as those concerned with admissions, academic standards, and the curriculum.

Alterations in the basic curriculum of a school will usually begin with a recommendation from the curriculum committee to the executive committee. Once the executive committee is satisfied with the recommended changes, the recommendation is forwarded to the Academic Vice President.

The educational control of the contents of individual courses generally rests with the faculty of a particular department. Hence the individual requirements for courses are specified by the department and individual faculty members are asked to construct courses that will meet these requirements. Nevertheless, individual faculty members are given considerable freedom in establishing the actual control and methodology for individual courses.

All of the above facts clearly indicate that the educational control for the activities of the Learning Resource System are widely decentralized and primarily in the hands of the individual faculty members and the departments. The LRC would be a center for service to all who wished to use it.

For that reason it is with the individual faculty members and departments that the Learning Resource System will establish its priority of activities for supporting the teaching role of the faculty. It can obtain learning packages just as the library obtains books other than standard textbooks but the determination of their use in the curriculum will be determined by the faculty, the departments and schools.

There is no such thing as a university-wide academic plan for the future of the instructional system at Georgetown. It is therefore likely that initially, a few schools or perhaps just a few departments within the school, would undertake to utilize the facilities and services of the LRC. The School of Nursing staff, already engaged in a major revision of the curriculum for that school, has expressed interest in using educational technology to implement the new courses they will teach. Other schools and departments, as they determine their needs, will seek LRC support for the work they do, but the educational control and initiatives are theirs, not the LRC's.

4.4.2 Financial Control

The primary instrument of financial control will be the budget allocated for the Learning Resource System. Supplements to the internal University budget will be the budgets of grants and contracts obtained by the Learning Resource Center from foundations and government agencies. These external budgets will be indispensible for carrying out a wide variety of programs deemed important by university faculty, students, and Learning Resource Center staff. These external budgets, however, will not provide the continuity of the basic University budget. The size of the University budget will depend on the contribution that the Learning Resource System is able to make to the courses, curriculum, and overall educational activity of the University. This contribution will be measured by the faculty, students, and other University staff that utilize the services of the LRC. While the qualitative improvements in learning activity will clearly be a major aspect of this contribution, the number of students and faculty affected will likewise be important.

4.5 Promoting Integration of University Resources and Services

Given the existing organization and the levels of the Georgetown University hierarchy to which they are responsible, the existing methods of resource allocation within the University, and the way in which curriculum reform projects are initiated by recommendations of a school curriculum committee to the school's executive committee, then it appears that the leadership for any significant change to assist all the students, faculty members and administrators at Georgetown in obtaining the best, most effective service and support in the areas in which the Learning Resource Center can provide service and support to them must come from the very highest levels of the University organization.

To integrate the existing, LRC-related activities into a coherent single activity providing greater service will require the support of the President and the Vice Presidents and Deans. Allocation of sufficient resources to carry on a program is necessary to insure success.

In addition, the principal emphasis on the Learning Resource Center as the nucleus of a university-wide Learning Resource System would provide a climate that could serve to minimize competition among schools to control portions of the system for their own special purposes, and encourage greater cooperation. Total insularity of schools and departments is an expensive luxury that cannot be supported in a modern university.

5.0 ALTERNATIVE SYSTEM DESIGNS

Since this is a system design project in which there is a building to be designed, there is a tendency to concentrate on the building, as in Section 3. The fact remains, however, that the physical facilities represent only one part of one dimension: the supporting subsystems. The other two parts of supporting subsystems are people and equipment. The personnel and their organization are crucial factors.

Many public school systems purchased large amounts of expensive equipment with funds under the National Defense Education Act. NDEA money did not provide personnel to operate the equipment, however, and much of the investment in equipment was probably wasted because the equipment has not been effectively used.

Georgetown University has an opportunity to avoid repeating these mistakes. The Planning Group cannot overemphasize the need for overall system planning, looking at the whole operation that is to be, and specifying personnel requirements -- both faculty and supporting staff needs -- along with requirements for facilities and equipment. Personnel requirements depend in part on the organization scheme selected and in part on the level of activity planned. Both are discussed in this section.

Three system organizations are described in the following sections. The first, a decentralized system, similar to what exists at present, would not make the most effective use of the university's scarce resources, and is therefore not recommended. A strongly centralized system, which might be very efficient and economical, is probably not feasible because of the organizational problems its implementation would cause. The Planning Group therefore recommends a mixed system, with centralization of some functions and activities. A range of possible levels of activity for the mixed system is described briefly.

5.1 Decentralized Learning Resource System

In designing a decentralized system, the aim would be to identify the functions of a Learning Resource System that are being performed now, and to retain, as much as possible, existing organizations with their functions intact. Functions not being performed at all, or -- like production of student videotapes -- being performed by the Audio-visual Department of the Lauinger Library insofar as their resources permit, would be assigned to a new organization.

The Medical-Dental Communications Department would continue to serve the Medical and Dental schools, while a new learning materials production facility for the Main Campus schools would be developed, with its own personnel and equipment.

All the libraries, the LRC and the Medical-Dental Communications Department would continue to purchase equipment and materials independently. There is a likelihood that without some arrangement for central purchasing of major items, serious mistakes could be made in selection of brands and models that are not compatible; duplication of expensive equipment might take place. Joint use of equipment could sometimes justify purchase of an expensive item that a single group's use should not.

Equipment maintenance in a decentralized system would be provided to Main Campus requesters by a new maintenance department in the LRC, although it seems likely that separate maintenance and repair shops with electronic test equipment for the Medical Center and for the rest of the campus would not be the most economical approach. Unless guidelines for standard equipment were negotiated among the component organizations, the problem of equipment incompatibility would continue to exist.

Indexing and cataloging of audio-visual materials could be performed by LRC staff without serious problems. The decentralized purchase of commercial materials by the Library and the LRC independently could permit duplication which for the most part might not be serious. However, if both decided independently to purchase the films from the BBC "Civilisation" TV series, the higher cost of decentralization would become apparent. (The series sells at an advertised price of $7000 from Time-Life films.)

The academic computation center, if it remained autonomous, would continue to provide the same support it does at present, expanding its services very slowly in response to requirements. If the Mason report recommendations were implemented, academic computer user advisors would no longer be responsible for a separate facility or a large budget. They could be part of the staff of the new central computer facility or part of the LRC staff. The latter approach seems to make more sense, for the computer is regarded by the Planning Group as a very significant Learning Resource.

5.2 Centralized Learning Resource System

If the personnel organization of the Learning Resource System were centralized, Georgetown University would designate a qualified person as a high-level coordinator for Learning Resources directly responsible to the President. This coordinator would be housed in the LRC building, from which the LR system would be operated. Reporting directly to the President would be necessary in order to resolve competing requirements among schools and campuses.

The person responsible for Learning Resources would be directly in charge of the three university libraries: Lauinger on Main Campus, and the Medical-Dental-Nursing and Law libraries. Central ordering, purchasing, and cataloging would be instituted, with a single specialized acquisition and indexing section to serve all the libraries. Commercial audio-visual materials would also be ordered by the group for the LRC and processed by the same purchasing and indexing group. A film order service would be included, for rental films and for purchase of those films that the faculty or the library or LRC staff chose to buy.

Once materials were indexed, a decision about their location would be made. In the centralized system, all non-print materials would be sent to the LRC.

The directors of the libraries, of the academic computation center, and of the LRC would all report to the person responsible for Learning Resources. Organizations would be functionally oriented; any overlapping of functional areas of activity would be eliminated by a decision of the President. Similar activities would be performed by a single group for the benefit of the whole Learning Resource system.

If priorities for services had to be negotiated, the individual responsible for Learning Resources would be on the appropriate level to reconcile the sometimes competing needs and desires of the Main Campus and the Medical Center users of the Learning Resource system.

A single production capability for graphic arts for all users would have to be larger than the present Medical-Dental Communications group staff of graphics designers. A slight saving in personnel could be anticipated from having a single operation. Some equipment might not have to be duplicated for a group somewhat larger than the present Medical Center staff.

Whether the bookstore is an operation that belongs in a centralized Learning Resource system was considered by the Planning Group. The consensus was that it did not, because it is retail sales oriented, and while there may be tapes and cassettes that are produced by the LRC for sale as teaching materials, the retail sales function is not believed to be an appropriate LRS function. By the same reasoning, the snack bar activity in the new building would probably be operated by some other group.

The university print shop, on the other hand, probably should be included as part of a centralized Learning Resource System, since it could effectively and more cheaply produce many learning materials now copied by Xerox copiers at considerable expense. Some cost reduction might result from this type of centralization and cost control.

5.3 Alternative Mixed Systems

Given the system functions described in Section 2, it is necessary to assign them all to some person or group within the Learning Resource System. Some reorganization of functions and organizations seems likely to be necessary in order to obtain the least cost alternative system that can be tolerated within the existing organizational constraints, already described in Section 4.0. In a report on Library Resources, the Information Systems Panel of the Computer Science and Engineering Board, National Academy of Sciences, gave special emphasis to two findings with respect to library systems:

> "The primary bar to development of national level computer based library and information systems is no longer basically a technology feasibility problem. Rather, it is the combination of complex institutional and organizational human-related problems and the inadequate economic/value system associated with these activities.
>
> "The quantitative contribution of information to productivity or effectiveness of industry, government and education is unknown; therefore, at the present state of knowledge, the construction of value/cost analyses is severely hampered."[5]

The same comments hold true for educational technology. The problem is not technological feasibility, but other complex factors. Valid quantitative evaluations of the contribution of technological support to education are not possible at the present state of knowledge because we do not really know how people learn.

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[5] Information Systems Panel, Computer Science and Engineering Board, "Libraries and Information Technology: A National System Challenge," National Academy of Sciences, Washington, D.C. 1972, pp. iv, 10.

It is possible to estimate the probable costs in terms of personnel, equipment, and space. However, the costs and benefits cannot be analyzed properly unless there are valid cost/benefit analyses of the present system against which to compare them. These data do not appear to be available. Some indications of potential benefits can be obtained from experiences of groups at Georgetown: the Medical-Dental Communications Department and the Psychology Department, but there are not many data regarding present benefits that can be used in cost analysis.

5.3.1 The Place of the LRC Director

The position of Director of the Learning Resource Center is a very important one, one which can make a distinct difference in the importance the LRC assumes in the university. It seems likely that the Director should have at least the same rank, responsibility, and influences as the University Librarian. Syracuse University has made theirs a priority effort by making the Director of Instructional Development an Assistant to the Vice Chancellor for Academic Affairs. Perhaps an Assistant to the President could be the Learning Resource System coordinator for Georgetown. It seems necessary to have influence on at least that high a level to generate sufficient momentum to effect change in the way technology is used in an institution of higher education like Georgetown.

The organization of each of the subsystems below can be more centralized and consolidated or less so, and more strongly supported or less so in each of several feasible developments, but operating generally along the lines described. A comparison of the possible systems is shown in matrix form in Table 4. Three different levels of activity within a set of mixed systems are discussed briefly in Section 5.4.

5.3.2 Production and Acquisition Subsystem

Production of instructional materials for the Main Campus would be part of the subsystem reporting to the LRC Director. The Department of Medical-Dental Communication could remain a separate entity either reporting to the LRC Director or coordinating its equipment requirements and its marketing activities closely with those of the Main Campus group. As much cooperation as possible should be encouraged, but there is little doubt that both sites and a larger staff would be required. Additional graphic designers and photography technicians would be needed.

Audio and video production people are needed on the Main Campus to staff the LRC studios. They should be closely integrated with the counterpart activity existing at the Medical and Dental School. A single organization operating at both locations appears feasible and desirable.

Acquisition of outside materials is a function already performed by the Library. To control duplication of expensive commercial materials, it would be desirable to expand the Lauinger Library's ordering department so that it could purchase the published materials requested by the LRC. A request for purchase could be handled like one originated by a faculty member.

A long-term academic plan for Georgetown University is necessary as a base for long-term effective acquisition and production planning in the LRC organization; the growth pattern of the LRC must be based on the academic planning. For example, if academic planners determined in 1973 that basic physics should be largely self-taught by 1975, the consultants in the LRC staff would have to begin at once to obtain the materials for published self-taught physics courses and to evaluate them with the Physics Department. If an existing published course could be used, it would be purchased and integrated into the

LRC program. If no existing course were suitable, the Physics Department might decide to work with the LRC to design one.

A long-range academic plan for each department and for the university as a whole, for probably five to ten years in the future, is necessary for the effective allocation and utilization of resources. The university cannot afford to develop self-paced learning materials for all courses, nor does it wish to do that. However, it must decide which courses should have the resources to dedicate to the development of integrated technological support. Cost-effectiveness becomes important in determining where to apply the resources to purchase or to develop self-taught courses or parts of courses. Which courses should have this support first, and the extent of the LRC resources that can be made available, are academic policy decisions that must be made in the context of university-wide planning. Are the courses selected by the most students the ones in which the benefits would be greatest? Which benefits are most significant: teaching more students, or providing alternative paths for defining styles? What are the academic criteria for decisions, and how are these related to the practical considerations of dollar costs?

At the same time that a long-range academic plan and a philosophy of educational technology decision-making are being developed by the faculty, students and administrators, detailed facility planning for the new academic building must be undertaken. In addition to the professional facility planners, other academic planners should be engaged in a course-by-course examination of requirements for facilities, to make sure that nothing is overlooked. Something at least as detailed as the questionnaire in Appendix II must be prepared with every faculty member.

The LRC Director and some key members of the staff need to be recruited in time to participate in the planning and design, so that technologic factors are considered at every point in the program planning and the building design. Finding the right person for the post of Director is a task for a dedicated faculty-student-administration team.

5.3.3 Indexing and Cataloging

A central index or union catalog of all instructional resources at Georgetown University should exist somewhere. Audio-visual materials and instructional packages could probably best be indexed by the LRC staff, with index cards supplied to the union catalog, which might be located in the Library. The LRC Materials Access Area would have a smaller catalog of just the audio-visual holdings.

Indexing of audio-visual materials will require some indexers and clerks. The personnel required depends on the volume of material and on the depth of indexing desired. Since it is rather difficult to browse through a film or filmstrip, deeper indexing appears to be desirable for these materials.

Depth of indexing may vary for different materials, or even for the same materials destined for different types of use. A research group in Ypsilanti, Michigan, reports the use of approximately 200 descriptor codes for "classifying, identifying, and selecting"[6] segments of its videotapes. A computer program is used to select and identify the segments relevant to the current activity. Scientists using motion picture films to study fluid mechanics developed an indexing (and distribution) service as a joint project of the American Society of Mechanical Engineers and the Engineering Societies Library. In a report of their work, the authors state, "A well-run film library with appropriate review for accession and an appropriately detailed catalog describing holdings can be ... a very useful research source."[7]

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[6] Nielson, Thomas G. and Marilyn G. Jeffs. "Videotape Documentation of an Infant Education Program," Audio-visual Instruction, Vol. 17 No. 4, April 1972, p. 29.

5.3.4 Storage and Retrieval

Audio-visual materials for medical and dental students will continue to be available through the Department of Medical-Dental Communication. On Main Campus, course related materials can be expected to be available in the LRC. Materials for self-study will be in the Materials Access Area. Films for class use would also be stored in the LRC, possibly at times duplicating films will be held by the Library, although efforts will be made to minimize duplication. As a minimum, two clerical employees to handle circulation of materials in the LRC would be necessary at all times. Since the materials access area would be open 15 hours a day, seven days a weeks, perhaps from 9 am to midnight daily, a staff of probably at least six full-time clerical employees would be necessary.

5.3.5 Maintenance and Repair

Technicians are needed initially to serve the existing (1972) audio-visual equipment on Main Campus. Further, when the LRC building opens, additional equipment maintenance technicians may be needed. It is expected that the TV and audio production technicians will be able to perform simple maintenance tasks in their areas of expertise, but that serious maintenance problems not covered by vendor maintenance contracts will be handled by the maintenance and repair engineers.

5.3.6 Testing and Evaluation

Instructional designers also devise testing and evaluation procedures for educational software. They would be needed initially to work with faculty subject matter consultants and with students. It should be the policy of the LRC that evaluations be planned and conducted by persons other than the ones who designed and created the materials. Software evaluation will be carried on in the LRC with student questionnaires and in class situations with teachers and objective tests.

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[7] Kline, S. J. and S. K. Cabeen. "Motion Picture Films as Research Data," American Documentation, October 1969, pp. 385-6.

5.3.7 Differences Among Activity Levels in the Mixed System

The primary differences within the basic mixed system organization described above are in the levels of activity expected. In Section 2.4, considerations of system sensitivity were discussed briefly. In this section, the estimated requirements for different levels of system activity are discussed in somewhat more detail, as three aspects of a feasible system.

Estimated personnel requirements for a range of levels of activity within a basic mixed system organization were summarizd in Table 3. The level of performance required to meet the 1975-1980 performance goals in Section 3.3 would fall at about the mid-point of the range. The lower figures describe a level of activity that assumes less production and fewer student users, with production of only one full semester course per semester, and 1500 student users (one third of the undergraduate student body). No equipment test laboratory would operate. The upper bound figures describe a level of activity that assumes production of three full semester courses and several mini-courses, and use of self-teaching materials up to an hour a day, by the entire undergraduate student body. Materials would be thoroughly evaluated and marketed widely. More sophisticated production facilities are assumed because of the marketing.

Decisions must be made, prior to designing in detail the system to be developed and the spaces to contain it, about the kind of system organization that would be feasible and desirable within the Georgetown University framework and about the desired size of the system, initially and in terms of future growth. Joint student-faculty-administration study teams will be needed to devise long-range academic plans and to develop the detailed facility plans in cooperation with the architects and the LRC staff. Extensive support and greater participation of all members of the university community will be required.

5.4 Analysis of the Alternatives

5.4.1 Organizational Configurations

The centralized system is probably not feasible because it might require organizational changes of greater magnitude than could be tolerated by the existing system, unless the entire university were prepared to undertake a massive reexamination of the way things are done, and to make significant changes. It has not been the impression of the Planning Group that very much change would be welcome or even acceptable.

The decentralized system would be very costly in terms of duplication, wasted effort, and inefficient use of resources. The decentralized system is thus an infeasible approach.

On the other hand, any of several variations of the mixed system could be reasonably fitted into the university structure. The most efficient variations would combine the media production services for the Medical Center users d the rest of the University. There would be considerable value to the LRC organization in the beginning if it could have access freely to the expertise of the present Department of Medical-Dental Communications. At a later date, the Medical Center would gain considerably from having access to the increased capability of the new organization. While additional personnel would be needed to prepare designs and create materials for Main Campus courses, the development of those courses could be enhanced greatly by the creation of a single production department.

Efficient variations of the alternative systems would probably also combine the present Audio-visual Department of the Lauinger Library into a comprehensive, university-wide audio-visual service in the LRC. Faculty complaints indicate that there is great difficulty in scheduling classes in the two AV classrooms in the library. Obviously, more classroom spaces are needed. The place where most of them will be found is likely to be in the new academic building. Thus, the most efficient arrangement in the long-range view would be to consolidate the audio-visual materials collection in the location in which most of those materials would be used. Indexing of AV materials could be done more efficiently in a central location, and one professor's research film may be another's class presentation, so that making the distinction between research materials (Library) and instructional materials (LRC) may be false. Presumably the union catalog in Lauinger, necessary to all the feasible alternatives, would help to minimize inconvenience.

At least one union catalog of non-print materials is necessary in the LRC so that materials stored in any of several places could be found by making one inquiry. The single request for information or service is one goal held for all the feasible alternative systems. The reference service is to be located in the LRC although the non-print materials may also be cataloged in the library's union catalog.

A single source for maintenance and repair services is another characteristic desired in a feasible alternative. The physical location of the maintenance shop is relatively unimportant. Common sense might dictate its location in the building in which there is the most equipment likely to be in need of service, but if space there were at a premium, it could be located in another building nearby.

Software and hardware evaluation functions should be performed by the LRC staff. Their results should be reported in a central file in the LRC to benefit those who might use the materials or equipment. The exact physical locations at which the evaluation activities themselves are performed are not worth argument, however. A single office to which the test and evaluation results are reported is a requirement for an efficient system.

A central place for preparing training materials and for planning and presenting workshops and informal instruction in the development and use of technological aids would be efficient. This activity should be performed in the LRC.

The LRC Director and staff members will be involved in some of the marketing and funding operations related to media materials. That function probably could best be centralized in the LRC administrative office because it will be necessary also to maintain contact with various people in the University Development office so that duplicate and competing projects do not appeal to the same sources for funds. Having one channel of communication for obtaining funds outside the university for media development could avert such problems.

Within these constraints, many different possible arrangements for organization and level of activity could be devised. The features in common can probably be accepted without severe difficulty, but the serious organizational decision points are:

- The relationship of the Department of Medical-Dental Communications to the evolving system, especially with respect to the conception, creation, and production of materials.
- The position of the Audio-visual Department of Lauinger Library vis a'vis the LRC.
- The matter of university-wide service for reference requests concerning media materials.

- The position of the LRC in the university hierarchy and the extent of the LRC Director's authority and influence.

When firm decisions have been made about these points, it will be possible to begin to design a feasible system, provided that the organizational arrangements make it possible for the system to operate effectively, and further provided that certain gaps in knowledge can be filled so that all the necessary information is available for the detailed design phase.

6.0 FINDINGS AND RECOMMENDATIONS

6.1 Findings

The principal finding is that there are a good many gaps in the Planning Group's information and authority. The Planning Group has identified several such gaps in its study of learning resources at Georgetown University. In some cases, new required information does not exist in a form in which it can be used. In others, the gap is in the charter of the Planning Group; it does not specify that the group has power to take action in some areas. Some of these gaps are described below:

1. A long-range academic plan

Problems that have been encountered in planning thus far have indicated that the university needs a long-range academic plan. The lack of such a plan represents a serious gap in our knowledge.

2. Organization of the System

How to organize the Learning Resource System represents another problem about which the group has some insights, but no authority.

3. A Director for Learning Resources

Whom to hire (or move) to head the Learning Resource System effort and to be responsible for the LRC development is another knowledge gap. A Search Committee appointed by the President could lead to a solution in this area.

4. Detailed System and Facility design

More specific design details are required, in terms of detailed requirements for service, and specifications for the facilities to accommodate them, in terms of building contents and the characteristics of different spaces. Site selection based on traffic patterns in the Main Campus area and on relationships of LRC activities with those carried on elsewhere requires study.

5. Incentives

Incentives of two kinds are missing: Those to obtain greater participation in the planning efforts themselves, and those to motivate faculty and students to use the capabilities of the LRC when available.

What incentives are necessary to involve students and faculty more deeply in the study activities on which to base further planning? Can students be given academic credit for strong contributions to this kind of work? What are reasonable compensations for faculty members who devote time and effort to these activities?

In addition to incentives to participate in planning, the university needs an incentive system to promote the use of the LRC capabilities. Should it integrate the LRC into campus life by allowing credit by examination for course work done using self-paced materials? What rewards are appropriate? Faculty time spent planning and designing materials for use in the LRC is time that is not available for writing articles for learned journals, or for earning direct remuneration from lecturing or consulting. Should faculty members be compensated with reduced teaching obligations, higher pay?

6. Financial Plan

A financial plan for building the LRC and for equipping and staffing it must be prepared. Without an adequate financial plan, the other efforts may be wasted.

6.2 Recommendations

A new Planning Group should be organized, with a new charter and a new set of tasks to perform, and with some compensation for the work it is to do. The assigned faculty and administration people should spend about 10 hours a week in this activity, with appropriate compensation. The same is true of students. There should be student members , and their rewards for participation should be significant as their contributions can be. The necessary tasks include the following:

- fill in the knowledge gaps regarding the long-range academic plan,
- prepare the LRC organization plan,
- act as a Search Committee for the Director for Learning Resources,
- recommend a building design and a system design,
- recommend a system of incentives, and
- prepare a financial plan.

If it performs these tasks successfully, Georgetown University has an opportunity to build for itself both a Learning Resource Center and a stronger academic community.

D. Henderson

D. Henderson

DDH/ses

APPENDIX I

TABLES OF FUNCTIONS AND SUPPORTING SUBSYSTEMS

TABLE IV

COMPARISONS OF ALTERNATIVE SYSTEM ORGANIZATIONS

	PRESENT
ACQUISITION Print materials Non-print materials Computer software	Lauinger, Medical & Law libraries independent procurement by each library & user of equipment. Computation Center
PRODUCTION Print materials Non-print materials Computer software	Not done. Medical Center Communications Dept. prepares audiovisual aids, videotapes self-paced materials. Main Campus psychology Dept. prepares self-paced materials. SLL prepares audio & video tape. Computation Center prepares software.
INDEXING, CATALOGING Print materials Non-print materials Computer software	Lauinger, Medical & Law libraries independent procurement by each library & user of equipment. (1) Not done systematically. Volume of programs has not required formal index to date.
STORAGE, RETRIEVAL Print materials Non-print materials Computer software	Lauinger, Medical & Law libraries independent procurement by each library & user of equipment. Computation Center
DELIVERY, CIRCULATION Print materials Non-print materials Computer software	Lauinger, Medical & Law libraries independent procurement by each library & user of equipment. Computation Center
MAINTENANCE, REPAIR Print materials Non-print materials Computer software and hardware	Lauinger, Medical & Law libraries independent procurement by each library & user of equipment. Materials available from libraries. Equipment on Main Campus not the explicit maintenance responsibility of any group (2). Medical-Dental Communications Dept. provides materials & equipment maintenance service. SLL maintains its own equipment. Computation Center has contract maintenance for hardware; maintains software.
EVALUATION, TESTING Print materials Non-print materials Computer software	Not done. Medical-Dental Communications evaluates medical center materials. No formal evaluation beyond the individual department. No documentation of user evaluations. Computation center tests software before releasing it to users.
STAFF DEVELOPMENT, USER TRAINING Print materials Non-print materials Computer software	Lauinger Library tour for new students. Informal instruction in use of equipment. No formal program. Computation Center provides assistance on request.
MARKETING, FUNDING Print materials Non-print materials Computer software.	Individual contacts with publishers. Medical-Dental Communications Dept. markets some materials to publishers. No formal activity on Main Campus. No known marketing activity. (Free exchange of programs is usual in academic computation centers.)

CENTRALIZED SYSTEM	DECENTRALIZED SYSTEM	MIXED SYSTEMS
Single facility for purchase of books & media materials. Centralized purchasing--compabible brands only.	Independent purchasing by libraries, LRC, Medical-Dental Communications for separate special interest groups. No guidelines for brand compatibility. Very little compatibility likely.	Independent purchasing for libraries; LRC joint purchasing with Medical-Dental Communications. Guidelines & standards for brand selection stressing reliability & compatibility.
Not contemplated. Single production staff for media materials for entire university. Medical-Dental Communications & a Main Campus group would be merged so that equipment & expertise could be shared. Outside clients might be supported. Single computer facility with some LRC staff for academic user support.	Not contemplated. LRC production staff for media materials for Main Campus. Medical-Dental Communications Dept. Staff to produce materials for Medical Center users. Two facilities with some duplication of equipment. No outside clients. Academic computation center with staff at the computer site (and not available in the LRC).	Not contemplated. Single production staff (possibly at more than one site) to prepare media materials for entire university. Outside clients (e.g., consortium members) might also be supported on a fee basis.
Central[illegible] book & media processing for 3 libraries & LRC. Union catalog in Lauinger; special catalogs in Medical, Law libraries & LRC. LRC catalog would list all non-print materials including computer programs.	Independent indexing & cataloging by libraries, LRC. No union catalog.	Central indexing of AV materials by LRC with information filed in union catalog in Lauinger Library, Medical Library. AV materials purchased by Library would also appear in LRC catalog to control duplication. Information requests for any AV materials would be handled through LRC.
Storage of materials at separate locations, with access via the centralized catalog. All AV materials would be stored in LRC.	Storage of materials at separate locations; no access via centralized catalog.	Storage of materials at separate locations of most probable use, but with access to AV materials via one of the union catalogs. Most AV materials would be stored in LRC.
Delivery of materials at separate locations or, by arrangement with a central request service, delivery to any location within 4 to 6 hours (overnight if request made after 6 pm). Computer terminals at various locations including LRC, where staff assistance would be available.	Delivery only from the individual site at which materials are located. No interactive terminals. Batch service at Computation Center. Possibly one or more Remote Job entry terminals in LRC and elsewhere.	Single request service in the LRC could provide delivery of materials & equipment to any university location within 24 hours. Some interactive computer terminals in the LRC. Consultant available in LRC.
Single, central maintenance & repair service with all equipment inventoried and servied (preventive maintenance on a schedule and repairs as required). Computer hardware would still be serviced by vendor maintenance contract.	Libraries repair and rebind books. Separate maintenance services for each library, for Medical-Dental Communications Dept., for Main Campus audio-visual services and LRC equipment. Some installed equipment would be served by vendors, with contract maintenance the responsiblity of whoever was in charge of the building. Vendor maintenance contract with computation center.	Libraries repair and rebind books. Equipment maintenance provided by single central maintenance and repair service. Complete inventory of all equipment so that preventive maintenance can be scheduled. Vendor maintenance for computer hardware.
Not contemplated. Centralized staff for testing, evaluating commercial materials and documenting results. Equipment test laboratory. (Materials produced at G.U. would be tested rigorously at G.U. and probably field tested elsewhere prior to marketing.) Computation center would test and evaluate programs for users, documenting their evaluations.	Not contemplated. Each entity would evaluate the equipment and materials it purchased or produced. No independent testing and no provision for interchange of information for interchange of information with other potential users at G.U. Each user would test his own software. Documentation of test results optional.	Not contemplated. LRC staff would evaluate commercial materials, produce reports, accept reports and evaluations from faculty & students maintain documentation of evaluations in quick reference form. Software produced at G.U. would be tested at G.U. and elsewhere. The testing would be done by instructional design specialists other than those who design the materials. Hardware testing lab for equipment.
Training materials (cassette tapes) for self-paced introduction to libraries, LRC, computer center capabilities and services. Periodic workshops for faculty & students who want to learn to operate equipment, produce materials, design courses and mini-courses. Workshops for computer users.	Training materials would be developed by each entity for its users. (This would probably be too expensive for separate groups, and therfore would not be done.) Occasional workshops for users. (Also expensive if done on a piece meal basis.)	Training materials for self-instruction in use of libraries, LRC, computer center and in operation of equipment would be produced by LRC for use in decentralized locations. Generalized and specialized workshops for teachers and students in various locations. Computer user workshops.
Not contemplated. LRC staff would maintain contact with various publishers and software houses. If computer programs were to be sold, they would probably be handled on an individual basis. LRC staff jointly with university development office would seek funds for projects.	Not contemplated. Many individuals would be trying to maintain contacts with publishers and with funding agencies. The rapport with the university development office would be complicated.	Not contemplated. LRC staff would develop and maintain contacts with publishers, media software houses, computer program services. LRC staff jointly with faculty and university development staff would seek funds for projects.

NOTES: (1) INDEXING AND CATALOGING REPORTEDLY SEVERAL MONTHS BEHIND IN LAUINGER PRINT AND AV DEPARTMENTS.

(2) THE LRC PLANNING GROUP HAS RECOMMENDED AN IMPROVED METHOD FOR HANDLING EQUIPMENT MAINTENANCE IN THE IMMEDIATE FUTURE.

TABLE V

PRINT MATERIALS: Books, Reports, Periodicals (hard copy)

FUNCTIONS	SUPPORTING SUBSYSTEMS		
	People	Facilities	Equipment
ACQUISITIONS • order books, accession books • accept gifts to Library • order and receive periodicals • order Library of Congress cards	Acquisitions clerks Faculty (request for purchase of inter-library loan) Students (requests)	Library order department Inter-Library loan department	Office equipment Catalogs of what is in print, what is available in other libraries
PREPARATION • mark books and periodicals			
INVENTORY; INDEXING, CATALOGING • obtain Library of Congress cards • obtain journal indices, Reader's Guide to Periodical Literature, etc. • prepare special bibliographies • perform original indexing as required	Catalogers Indexers Reference Librarians	Work space for Library catalog department Reference	Card catalog Other special catalogs
STORAGE, RETRIEVAL • store materials (books, periodicals) • retrieve materials (manually)	Librarians, Technicians Stack Assistants	Storage space: Open stacks Reserve shelves Carrels Reading areas Special areas for rare books	
DELIVERY, CIRCULATION • circulate materials • check in returned materials • inspect materials for damage • provide copies of selected materials	Checkout clerks	Library desk	Circulation accounting system Copying machines

PRINT MATERIALS (Continued)

FUNCTIONS	SUPPORTING SUBSYSTEMS		
	People	Facilities	Equipment
MAINTENANCE, REPAIR	Clerks	Work space	
• repair of damaged books and periodicals		Library book repair area	
• replacement of lost books and materials	(acquisitions clerks)	Bindery (commercial)	
EVALUATION, TESTING			
STAFF DEVELOPMENT, USER TRAINING			
• train students to use the Library (new student orientation)	Librarians		
MARKETING, FUNDING			
• obtain funds (from University)	Sales clerks	Retail sales outlet	
• sell books to students, others			
• sell copies to students, others			

TABLE VI

GRAPHICS: Still pictures, maps, slides, transparencies

FUNCTION	SUPPORTING SUBSYSTEMS		
	People	Facilities	Equipment
ACQUISITION • order graphics on request • order projectors	Order clerks Faculty, students	Office space	Catalogs of available materials Catalog of LRC holdings Catalog of equipment, product reports
PREPARATION, PRODUCTION • specify goals • design the materials • prepare the materials	Students, faculty Instructional designers Graphic artists Technicians	Production space	Equipment for marking slides and transparencies from existing materials Graphic arts equipment Copying equipment
INVENTORY: INDEXING, CATALOGING • preview materials • prepare catalog entry (original indexing as required)	Catalogers, indexers	Work space Viewing facility as required	Catalog system Equipment for projection, as as required
STORAGE, RETRIEVAL • store pictures, maps, slides, transparencies • store projection equipment (portable) • retrieve materials and equipment • copy materials as required	Clerks, technicians	Storage space	Special containers for various types of materials
DELIVERY, CIRCULATION • circulate graphics, equipment • check in returned materials • inspect returned equipment	Clerks Technicians	Circulation desk Office space	Circulation accounting system

GRAPHICS: (Continued)

FUNCTIONS	SUPPORTING SUBSYSTEMS People	SUPPORTING SUBSYSTEMS Facilities	SUPPORTING SUBSYSTEMS Equipment
MAINTENANCE, REPAIR			

• repair and maintain
  • materials
  • equipment for projection
	Maintenance and repair technicians	Maintenance and repair facility	Assorted projectors
			Test equipment
			Spare parts

EVALUATION, TESTING			

• keep records of
  • equipment malfunctions
  • preventive maintenance
  • test results
• produce reports
• evaluate software
	Clerks
	Technicians
	Graphic artists
	Instructional design evaluators
	Faculty
	Students
		Testing laboratory	Test laboratory equipment

STAFF DEVELOPMENT, USER TRAINING			
• train students and others to prepare materials and operate equipment	Technicians	Multi-purpose space	Equipment and materials
• develop self-instructional materials • assist in planning support • assist in developing programs and evaluating materials	Instructional designers Faculty Students		
MARKETING, FUNDING			
• maintain liaison with publishers, distributors	Marketing personnel	Office space	Demonstration capabilities: exhibits demos
• maintain contact with foundations and government agencies	Fund raising specialists		
• sell selected materials for student use	Sales clerks	Retail sales outlet	

TABLE VII

NON-PRINT MATERIALS: Microfilm, Microfiche, etc.

FUNCTIONS	SUPPORTING SUBSYSTEMS		
	People	Facilities	Equipment
ACQUISITION • order microfilm • order microfiche	Acquisition Clerks Faculty (requests) Students (requests)	Office space	Catalog of available microfilm and microfiche materials
PREPARATION • prepare microfilm, fiche from published and unpublished hard copy • prepare hardcopy on request	Microfilm and microfiche technicians	Production space	Microfilm cameras Microfiche cameras "Blowback" equipment for film and fiche
INVENTORY, INDEXING, CATALOGING • obtain index materials (ERIC, etc.) • perform original indexing as required	Catalogers, Indexers	Work space	Card catalog Special catalogs
STORAGE, RETRIEVAL • store microfilm, microfiche • retrieve materials	Technicians Stack assistants	Storage space	
DELIVERY, CIRCULATION • circulate microfilm, microfiche • circulate readers (?) • check in returned materials and equipment • inspect returned materials and equipment • provide hard copies on request	Checkout clerks Technicians		Circulation accounting equipment Microfilm, microfiche readers Copiers "Blowback" equipment

MICROFILM, MICROFICHE (Continued)

FUNCTIONS	SUPPORTING SUBSYSTEMS		
	People	Facilities	Equipment
MAINTENACE, REPAIR • repair damaged materials • replace damaged materials • repair equipment	Maintenance and repair technicians	Service area	Microfilm, fiche readers Maintenance and repair tools and equipment
EVALUATION, TESTING • test and evaluate microfilm and microfiche readers and printers • evaluate microfilm and microfiche	Test engineers Instructional design evaluators	Testing laboratory facility	Testing laboratory equipment
STAFF DEVELOPMENT, USER TRAINING • train students in use of microfilm, microfiche equipment • train faculty	Technicians	Work space	Equipment
MARKETING, FUNDING • obtain funds			

TABLE VIII

NON-PRINT MATERIALS: Audio Tape (reel and cassette types)

FUNCTIONS	SUPPORTING SUBSYSTEMS People	 Facilities	 Equipment
ACQUISITION • order pre-recorded tapes • order blank tapes • order tape players	Acquisition clerks Faculty, student requestors	Office space	Office equipment Catalog of commerical audio tapes Catalog of materials available in LRC
PREPARATION • determine when tapes are to be prepared • define need for course materials • accept student requests for lecture taping • design tape materials • produce the materials	Faculty, student requestors Instructional designers Audio productive engineers Technicians	Recording studios Classrooms with sound systems	Tape recording equipment (connected to remote classroom with sound system).
INVENTORY: INDEXING, CATALOGING • listen to commercially prepared material, taped lectures • accept indexing data from persons who prepare tapes • perform original indexing as required	Audiovisual materials Catalogers and Indexers Faculty, students	Work space for cataloging activity Recorders/players (reels and cassettes)	Catalog
STORAGE, RETRIEVAL • store audio tapes, (reel and cassettes) • store cassette recorder/players • retrieve tapes and equipment • copy tapes for loan or sale	Technicians	Storage space for tapes, equipment	Rapid tape copiers (reel and cassette)
DELIVERY, CIRCULATION • circulate tapes, players • check in returned tapes • check in and inspect players	Clerks	Circulation desk	Circulation accounting equipment

NON-PRINT MATERIALS: Audio tape (Continued)

FUNCTIONS	SUPPORTIVE SUBSYSTEMS People	 Facilities	 Equipment
MAINTENANCE, REPAIR • repair tape players • maintain tape players • maintain/repair recording studio equipment • maintain/repair dial access audio equipment • maintain/repair classroom sound equipment	Maintenance and repair repair technicians	Maintenance and repair facilities	reel tape player/recorders cassette tape player/recorders central dial access system test equipment
EVALUATION, TESTING • keep records of malfunctioning equipment • keep records of preventive maintenance • keep records of testing results • produce reports • evaluate software • recommend improvements to equipment and programs	Clerks Equipment test engineers Instructional designers, evaluators, test engineers	Testing laboratory Classroom test areas	Test laboratory equipment
STAFF DEVELOPMENT, USER TRAINING • train students and others to operate equipment and use materials • develop self-instructional materials for this equipment • assist teachers in developing programs and evaluating materials	Technicians Instructional designers Test subjects	Multi-purpose spaces	Typical equipment and materials
MARKETING, FUNDING • maintain liaison with publishers, foundations and government agencies • sell tapes to students	Funding specialists Sales clerks	Office space Retail sales outlet	

TABLE IX

NON-PRINT MATERIALS: Motion Pictures

FUNCTIONS	SUPPORTING SUBSYSTEMS		
	People	Facilities	Equipment
ACQUISITION • order films on request • order materials for production • order projectors	Order clerks Faculty, students	Office space	Catalogs of available films Catalog of equipment on hand Catalog of films in LRC
PREPARATION, PRODUCTION • specify educational goals • design the production • prepare the script • produce the motion picture • edit the film	Students, faculty Instructional designers Producers, directors Actors, narrators Editors	Production space	Sets Costumes, properties Cameras Production equipment--lights, etc Editing equipment film editors, rewinds, film splicers, film cement
INVENTORY: INDEXING, CATALOGING • preview materials • prepare catalog entry (original indexing as required)	Catalogers Indexers	Work space Film viewing space	Catalog system Projectors, screens
STORAGE, RETRIEVAL • store films • retrieve films	Technicians Stack assistants	Storage space	
DELIVERY, CIRCULATION • circulate films, projectors • check in returned films • check in and inpsect projectors	Clerks	Circulation desk, office space	Circulation accounting system
MAINTENANCE, REPAIR • repair projectors • maintain projectors • maintain/repair production and film equipment	Technicians		Test equipment Film cleaners and preservatives Automatic film inspection equipment

NON-PRINT MATERIALS: Motion Pictures (Continued)

FUNCTIONS	SUPPORTING SUBSYSTEMS People	Facilities	Equipment
EVALUATION, TESTING			
• keep records of malfunctioning equipment • keep records of preventive maintenance • record test results • produce reports • evaluate software • recommend improvements	Clerks Equipment test engineers Instructional design evaluators Faculty Students	Testing laboratory	Test laboratory equipment
STAFF DEVELOPMENT, USER TRAINING			
• train students and others to operate equipment and use materials • develop self-instructional materials for this equipment • assist teachers in developing programs and in evaluating materials	Technicians Instructional designers Faculty Students	Multi-purpose spaces	Typical equipment and materials
MARKETING, FUNDING			
• maintain liaison with film distributors, foundations and government agencies	Funding specialists	Office space	

TABLE X

NON-PRINT MATERIALS: Videotape

FUNCTIONS	SUPPORTING SUBSYSTEMS		
	People	Facilities	Equipment
ACQUISITION • order pre-recorded tapes • order blank tapes	Order clerks	Office space	Office equipment Catalog of commercial video-tapes Catalog of materials available in LRC Inventory of equipment in LRC
PREPARATION, PRODUCTION • determine need for tapes to be prepared • define educational goals • accept student requests for lecture taping • design television materials • produce television materials	Faculty, students Instructional designers Producers, directors, actors technicians Engineers	Television studios Productivity work space Classrooms with video systems	Cameras, VTRs film chains Processing amplifier Switcher/fader Waveform monitor Amplifier Sync generator
INVENTORY: INDEXING, CATALOGING • preview material to be indexed • accept indexing data from tape originators • perform original indexing as required	Audiovisual materials catalogers & indexers Faculty, students	Work space Videotape viewing facility	Catalog system VTRs, monitors
STORAGE, RETRIEVAL • store videotapes • store playback equipment (portable) • retrieve tapes and equipment • copy tapes for loan	Clerks Technicians	Storage space for videotapes and portable equipment	Tape copiers
DELIVERY, CIRCULATION • circulate tapes, players • put tapes into central CCTV system • check in returned materials • inspect returned equipment	Clerks Technicians	Circulation desk, office space	Circulation accounting system

NON-PRINT MATERIALS: Videotape (Continued)

FUNCTION	SUPPORTING SUBSYSTEMS		
	People	Facilities	Equipment
MAINTENANCE, REPAIR			
• repair and maintain • videtape recording equipment • television monitors (in carrels and classrooms)	Maintenance and repair technicians	Maintenance and repair facility	VTR (reel and cassette) Central dial access system Test equipment
• dial access equipment for TV			Spare parts
EVALUATION, TESTING			
• keep records of • equipment malfunctions • preventive maintenance	Clerks Technicians Test engineers	Testing laboratory	Test laboratory equipment
• procedure reports • evaluate software	Instructional design evaluators Faculty, students		Evaluation models
STAFF DEVELOPMENT, USER TRAINING			
• train students and others to prepare materials and to operate equipment	Technicians	Multi-purpose space	Typical equipment and materials for training
• develop self-instructional materials • assist faculty in planning for videotape development • assist teachers in developing programs and in evaluating materials	Instructional designers Faculty, students		
MARKETING, FUNDING			
• maintain liaison with: • TV networks	Marketing personnel	Office space	Video playback equipment
• Cable TV systems • AV distributors • foundations • government agencies • provide advice and counsel in copyright matters, marketing	Fund-raising specialists	Demonstration facilities	

TABLE XI

COMPUTER SOFTWARE, TIME-SHARING SERVICES

FUNCTIONS	SUPPORTING SUBSYSTEMS People	 Facilities	 Equipment
ACQUISITIONS • order computer programs on request • arrange for time-sharing service • order supplies	Clerks Faculty Students	Office space	Catalogs of programs within and outside the LRC System Catalog of services
PREPARATION, PRODUCTION • determine need for program; define goals • design programs • code and test programs • document programs • operate programs for users	Faculty, students Computer systems designers Programmers, coders Editors Machine operators	Input preparation area Computer center	Keypunches and other computer input preparation equipment Terminals for interactive computing Computer facility equipment
INVENTORY: INDEXING, CATALOGING • accept indexing data, or • study program to determine characteristics • perform original indexing as required	Clerks Computer technicians	Work space	Catalog system Access to computer system as required
STORAGE, RETRIEVAL • store programs (cards, magnetic tapes or disks; system libraries) • retrieve programs • copy programs for other users	Clerks	Storage space with temperature and humidity control	
DELIVERY, CIRCULATION • make programs available to users • circulate documentation, user manuals • monitor system libraries	Clerks Technicians	Office space	User accounting system

COMPUTER SOFTWARE AND TIME-SHARING (Continued)

FUNCTIONS	SUPPORTING SUBSYSTEMS		
	People	Facilities	Equipment
MAINTENANCE, REPAIR			
• repair and maintain computer hardware	Computer technicians	Computer Center	Test equipment, tools
• support computer system software	System programmers	Office space	Office equipment
• support computer applications software	Applications programmers		Access to computer
EVALUATION, TESTING			
• keep records of:	Clerks	Office space	Office equipment
• hardware problems	Technicians	Test lab	Test equipment
• software problems			
• preventive maintenance			
• test results			
• produce reports	Instructional designers		
• evaluate software	Computer system designers		
STAFF DEVELOPMENT, USER TRAINING			
• train students and others to use materials	Technicians	Office space	Computer center
• develop self instructional materials in programming languages and techniques	Instructional designers Computer specialists	Computer center	Equipment
• assist in planning for computer software	Faculty		
• assist in evaluating instructional programs	Students		
MARKETING, FUNDING			
• maintain liaison with:	Marketing personnel	Office space	
• computer manufacturers	Fund raising specialists	Computer center for demonstrations	
• other computer centers			Computer center
• publishers			Equipment
• foundations			
• government agencies			
• sell computer software and services to non-instructional users	Accounting clerks		Computer accounting system

TABLE XII

LIVE PRESENTATIONS - Theater, Psychodrama, Conferences, Interactions

The functions are oriented toward theater, but would be similar (less complicated perhaps) for the other presentations.

FUNCTIONS	SUPPORTING SUBSYSTEMS		
	People	Facilities	Equipment
ACQUISITION			
• obtain play script	Directors		
PREPARATION/PRODUCTION			
• write play script	Dramatist		
• design scenery, costumes	Designers	Work spaces	
• obtain participants,	Director, Actors		
• build scenery	Stage crew	Scene shop	Woodworking tools other special tools
• create costumes	Costume personnel		
• organize properties	Property personnel	Dressing rooms	Properties
• prepare productions		Rehearsal space	Properties
			Lighting and sound systems
INVENTORY			
• consult inventory list of items from other productions		Work space	
• index and store re-usable items for future productions			
STORAGE, RETRIEVAL			
• store re-usable scenery and properties	Stage crew	Storage space (scene shop area)	
• store re-usable costumes	Wardrobe personnel	Storage space for costumes	Clothes racks
DELIVERY/CIRCULATION			
• make the play available to spectators through advertising, ticket sales, etc.	Clerical help Production staff	Office space	Ticket sales and seat accounting system
• present production		Dressing rooms Theater space	
MAINTENANCE/REPAIR			
• repair and maintain presentation space, audience space	Stage crew		
• maintain sound systems, lighting systems	Maintenance technicians Sound & light crew	Repair space	Tools

LIVE PRESENTATIONS (Continued)

FUNCTIONS	SUPPORTING SUBSYSTEMS		
	People	Facilities	Equipment
EVALUATION, TESTING			
• keep records of theater attendance, production profits, critical comment	Clerical help	Office space	Office equipment
• prepare reports			
STAFF DEVELOPMENT, USER TRAINING			
• train students and others to produce plays			
• train students and others to participate in theater			
• assist in planning and critiquing productions	Technicians Dramatists Directors Faculty Students	Rehearsal space Theater space	
MARKETING, FUNDING			
• obtain funds for further productions	Business staff	Office space	Office equipment
• maintain liaison with • television companies • film makers • publishers • etc.			

APPENDIX II

QUESTIONNAIRE RESULTS

At the request of the Faculty Advisory Committee, the Planning Group prepared and circulated a questionnaire to obtain additional information regarding faculty desires for services and equipment from the LRC. The questionnaire was sent to 26 department chairmen on March 1, 1972, with a request that it be returned by March 22, 1972.

Analysis of the questionnaires returned as late as March 29th was performed by Dr. Brenda Forman of MITRE. Dr. Forman had not read the foregoing paper, nor had she attended any of the meetings with faculty members. The results of the questionnaires, reported in this section by Dr. Forman, tend nevertheless to confirm many of the ideas obtained independently by the Planning Group in its meetings with the faculty.

A copy of the questionnaire itself is included in this appendix.

ANALYSIS OF THE LEARNING RESOURCE QUESTIONNAIRE

A total of 17 questionnaires was returned, representing the following 17 departments:

- Arabic
- Biology
- Business Administration
- Classics (Two questionnaires returned)
- Computation Center
- Fine Arts
- French
- German
- History
- Italian
- Mathematics
- Psychology
- ROTC Air Force
- ROTC Army
- Sociology
- Spanish

The Theology Department returned a summary statement in place of a completed questionnaire. Eighteen departments altogether were therefore represented in the survey. In the results discussed below, th instances in which the frequency of response exceeds eighteen are due to the fact that some departments reported using the same equipment in more than one area (e.g., both classrooms and lecture halls). The number of responses reported appears in paratheses.

What is Presently Used?

Present usage is concentrated on fairly basic items of equipment: blackboard and chalk (29), electrical outlets (16) and window shades (29). The audio-visual aids most frequently used are 16 mm motion pictures and audio tape recorders (15 each), which accounts for the equally heavy usage of audio-visual projectors (29). The bulk of this usage, moreover, takes place in the context of the basic classroom, although the seminar room for six to twelve people is also widely used (14).

The frequency of usage drops off as the sophistication of the equipment in question rises. The next most frequently used audio-visual medium after 16 mm films and tape recorders is 2 x 2 slides (10). Film strips, overhead projection and record players follow (8 each), after which come sound film strips (7). TV videotape recording (6), videotaped or live TV viewing (5), and opaque projection (5) are next, while super 8 mm motion pictures bring up the rear (3). Three departments reported using TV monitors in either classrooms or lecture halls, while two employ a stage for in-class dramatic presentations.

An exception to this pattern appears in the fact that ten departments reported using a studio for audio tape production. This is about the only instance where a fairly sophisticated complex of equipment is reported as being in use by a majority of the departments responding. The more prevalent pattern is reasserted in the frequency of usage of a studio for videotape production (4). Whenever more sophisticated equipment such as self-paced learning texts and related materials and computer facilities is in question, the prevalent pattern is clearly visible: the heaviest usage of any of these materials was of self-paced learning materials for training in related methodologies (7), while of the other possibilities under these sections, self-paced learning materials for remedial work, use of computer facilities for statistical work and for access to large volumes of data were each reported as being used by five departments. Laboratory/workshop areas for simulation games drew one response. All other items were reported in use by no more than one or two departments.

The pattern that emerges from the present usage portion of the questionnaire, therefore, is a fairly traditional one: blackboard and chalk are overwhelmingly the most widely used items of classroom equipment, and 16 mm films and tape recorders are the standard audio-visual aids. More sophisticated equipment is by no means unknown, but it is nowhere so heavily used.

What Would Be Used if it Were Available?

The responses indicate emphatically that supporting services would be most welcome of all. At the top of the list are an audio-visual projector delivery service and an audio-visual materials search, procurement and/or delivery service (14 each). Close behind these two are videotaping of classroom presentations and technical support to aid in the use of a computer in various disciplines (13 each). Technical support to aid in the production of audio-visual materials drew twelve responses, while a centralized bibliographic search service drew ten.

Priority ratings were not always indicated and the incompleteness of those results prevents exact tabulation of them. The responses given do, however, yield an impression of emphasis or diffusion of priority. On this basis, the audio-visual projector delivery service, the audio-visual materials search, procurement and/or delivery service and the technical support to aid in the production of audio-visual materials had a concentration of high priority ratings. A more scattered pattern of priority estimation appeared in connection with the videotaping of classroom presentations and technical support to aid in the use of computers.

Response was less decisive in connection with the desire for items of classroom equipment and audio-visual aids. Interestingly enough, the strongest demand appears to be for the item of equipment that is already the most widely used: audio-visual projectors (9 for classroom use; 7 for lecture room use). Respondents appear to feel that they could use a lot more of the item which is already most familiar to them. Response for other, possibly less familiar, items was considerably less. Projector and lighting controls at the lectern and opaque projection drew nine responses each. These were followed by TV monitors (8 for classroom use, 2 for lecture room use), overhead projection (8), computer facilities for access to large volumes of data (8) and computer terminals for self-paced learning of related methodologies (8).

Priority ratings attached to these responses were a good deal more scattered than those attached to supporting services preferences: only overhead projection and computer facilities for access to large volumes of data displayed a clearcut concentration of high priority ratings. The prioritization results suggest that the demand for items of equipment and audio-visual aids is considerably less focused than that for supporting services.

Relative Weighting of Responses

The departments that responded to the questionnaire represent 67,149 or just over 50 percent of all undergraduate student hours and 6,361 or about 38% of all graduate student hours enrolled in the academic year 1970-1971. The group responding also represents primarily the smaller departments. Of the four departments having more than 10,000 undergraduate student hours, only the History Department completed a questionnaire, and of the four departments having between 5,000 and 10,000 undergraduate student hours, only three are represented in the survey. In addition to these three, the Department of Business Administration reported for the Accounting, Finance and Management Departments as well, so that this single questionnaire represented a combined total of 7,728 undergraduate student hours. All other respondents represented less than 5,000 undergraduate student hours apiece.

The sample as a whole, therefore, is not so accurately representative of the entire university as might have been wished inasmuch as it overrepresents the smaller faculties. Within the sample available, however, the pattern of responses does not vary dramatically with the size of the department, i.e., much the same items are mentioned as being now in use and most desired, whether the department responding be a relatively small faculty such as Fine Arts or the largest department reporting (History). Differences in detail do exist, yet it seems proper to draw the conclusion that in general, current practices and needs are very similar whether the department be small or large. This impression does something to counteract the partial nature of the sample, inasmuch as it gives some grounds for supposing that the general outline of the results might have been largely similar even if all departments had responded.

Comments Received

The majority of questionnaires included comments as to (1) specific deficiencies now encountered and (2) the direction which the LRC planning effort is taking. These comments are reproduced in full below.

Specific deficiencies now encountered:

1. Arabic Department:

"Poor soundproofing - disturbing noises from outside and adjoining classes. Plane noise. Loud steam noises!

"Very bad heating and cooling. Heating too hot; cooling too cold. Erratic! Thermostats don't work. Systems unaccountably turned on or off.

"Poor blackboards; not enough.

"Classrooms not kept supplied with chalk and erasers.

"Tape recording studio inadequate; need technicians to be constantly present when tapes are made, so as to monitor and correct errors."

2. Biology Department:

"Reiss 103 - Defective screen; no 2 X 2 or 3 1/4 X 4 slide projectors; no motion picture projectors.

"Reiss 112 - No projectors.

"All Reiss classrooms - no projectors; blackboards need more frequent washing."

3. Classics Department:

"The audio-visual room in Library is difficult to use for a slide lecture discussion. No permanent projectors. No fixed remote controls, etc.

"There should be some less conventional classroom space for discussion classes (round tables, semi-circular tiers of desks, even some empty carpeted rooms). The orientation of desks towards podium is inhibiting for both professor and students.

"Slide copying facilities would be useful, particularly if faculty could have access to the equipment to do copy/cropping work.

"There is no current space (as far as I know) for multi-media presentations (e.g., several slide projectors and film projectors, stereo tape equipment, perhaps video projection, used simultaneously). If there was, it would also be useful to have a media technician to assist in using such sophisticated equipment and in program design."

4. Computation Center:

"Dirty blackboards in 103, 262, 264, 112 Science.
"No projection screen in 55 Poulton.
"Chairs aligned helter-skelter in 262, 264 Science.
"Blackboard in 253 Nevils is too small."

5. Fine Arts Department:

"Rooms 133AV and 134AV are: too over-taxed
too small
too hot (winter)
too cold (summer)
too depressing
otherwise they are the kind of room we need more of."

6. German Department:

"Lauinger Library Classrooms: It would mean an essential improvement for my classes, if the rooms were designed so that the teacher does not have to be in front of the class all the time, but in the middle of the class and yet not too far from the blackboard. This might require a different shape of the room which permits, e.g., a 'horseshoe' sitting arrangement.

"Windows cannot be opened--after use by several classses in the wintertime, the air is stifling! (in spite of the ventilation system).

"Lack of natural light in one classroom."

7. History Department:

"Absence of desks, working electrical outlets, erasers, windows that open and close, shades or blinds, lectern, trash cans, temperature control, pigeon control in Gaston, soundproofing.

"Classrooms: doors and windows either won't open or close; burned out lights not replaced; either no blinds or shades, or they don't work; heat and A/C can't be adjusted; blackboards too small; broken desks, tables and chairs; rooms trash littered.

"Gaston Hall: pigeons roost in rafters and defecate on the seats and floors; stained glass windows are falling out of rotten frames and leaks in the roof are destroying the murals.

"Supporting services: the failure to maintain present facilities is appalling and reflects gross incompetence on the part of the University's maintenance staff. Yet you propose to turn over to them (and the thieves) thousands of dollars' worth of complicated equipment. You must be mad."

8. Italian Department:

"I believe there is a serious need for a 35 mm projector of the type available at movie theaters, making it possible to show full-scale films to large groups, for example, the Italian Club.

"The Department is also is in serious need of film projectors, tape recorders, record-players, and other audio-visual devices. We believe that such equipment is absolutely necessary for language instruction."

9. Psychology Department:

"Audio-visual rooms are never available when needed.

"There are never free classrooms around campus for special meetings during the day.

"There are no window shades in 204 White-Gravenor, therefore no movies can be shown."

10. ROTC Air Force:

"The problems we have with films (military government): (1) outdated; (2) do not arrive as scheduled, making it difficult to integrate films into course; (3) aimed at high school level or lower."

"Have better luck with NASA films and certain private industries."

11. ROTC Army:

"Heating - lighting - noise - old furnishings."

12. Russian Department:

"Classrooms - lack of audio-visual aids.

"Office - lack of space and privacy for advising students."

13. Sociology Department:

"Most rooms in Poulton Hall are overheated. Opening windows does not solve the problem because students near the window freeze and others are still too warm. It is noted in New Spaces for Learning that 'all Learning spaces should be air-conditioned . . . to provide a stimulating environment.'"

"Some rooms in Poulton have posts in the middle (P66 is an example). When the room is filled to capacity, some students cannot see the instructor and vice versa.

"In most rooms on the top floors of White-Gravenor, the acoustics are so poor that no classroom discussion is possible. This means the instructor is forced to lecture (Rooms 203 and 308 for examples).

"The emphasis in teaching today, stated by Father Henle, is faculty and students learning together. The structure of the classroom can encourage or discourage closeness between faculty and students. The renovation of Healy has added to the distance separating faculty and students by installing podiums with unmoveable desks. Podiums may be important in large lectern halls, but certainly not in small classrooms. 105 Healy is an example."

14. Spanish Department:

"Blackboard space is inadequate.

"Chalk is not supplied and often difficult to find.

"Rooms are not kept clean.

"Temperature is sometimes too high. Should be controllable, at least in large rooms.

"There is no place for students to hang their coats in some rooms.

"If smoking is permitted, there should be ash trays.

"Outside noises often interfere: jets overhead, motorcycles below. Soundproofing would be good.

"In many cases it was too difficult to establish a priority. This would seem to follow from the frequency of use.

"As a chairman, I feel the need for a separate office for the Departmental Secretary and an arrangement that provides some privacy for the Chairman. Sometimes it is necessary for him to be 'out,' but this is impossible under present conditions."

15. Theology Department:

"There is some rise in the use of audio-visual materials, but this is limited at present to a small number of professors, and even in this case is confined to a few films or audio cassettes. This sort of thing is now made possible by the library facilities, but these are difficult to reserve because of the regular use by other departments whose subject-matter lends itself more easily to this type of presentation. We have a few larger classes (some with fifty, a couple with ninety) which cannot fit in the library audio-visual rooms."

Direction which the LRC planning effort is taking:

1. Arabic Department:

"Please stress soundproofing and ventilation/heating/cooling.

"Please bear in mind main purpose; proper and sufficient classrooms of various sizes for language teaching. Hardware is fine, but should not interfere with main purpose."

2. Biology Department:

"So far, so good!"

3. German Department:

"There seems to be a great emphasis on the hardware. In my view, the use of such hardware is helpful, but not essential to the teacher. It can become meaningful if the planning effort aims simultaneously at the development of new teaching methods into which the use of hardware can then be integrated. The important question is not, it seems to me, 'If we offer you educational hardware, can you use it?' but rather, 'What are the primary goals of your teaching/studying?' What is needed for teachers and students can be derived from the answers to this question.

"Further: At present classrooms are either too small or too large.

Shortage of tape recorders.

Blackboard space in some cases insufficient (both as to quantity and quality)."

4. History Department:

"Until an effort is made to demonstrate successful applications of electronic technology to learning, the attitude of the faculty will remain either apathetic or hostile.

"The current survey is welcomed. A demonstration of applications of technology to learning in the humanities is needed. Our wants as indicated are basic (with the exception of an expressed interest in support of the theater and student 'live arts'). We are concerned with cost/benefit analysis and hope that this is soon forthcoming. Our discipline does not respond well to behavioral objectives at this point."

5. Sociology Department:

"There are not enough services provided by the Audio-Visual Department. Local films should be picked up and returned by A-V, rather than by the individual instructor. A-V should be able to reserve any size room for showing films, rather than the instructor calling several different places to find a large room.

"A-V should have sufficient technicians to be able to record TV shows on audio-visual tape, even if this requires evening hours. The department should also have enough technicians to provide help to faculty wishing to use new technology in their teaching or to students who wish to do an innovative paper--perhaps tapes and slides rather than the usual 20 pages. I have always found the people at A-V to be cooperative and helpful. However, the A-V Department does not have the staff or facilities to fulfill any requests."

6. Russian Department:

"I think that failing to provide proper office space, particularly for advisors, is a mistake. This is a must if we are to turn more toward the individual approach and less the 'mass lecture' idea."

7. Theology Department:

"The construction of facilities of the sort you envisage will stimulate our use of them but at present we do not know of many materials that are useful to us (or that we have the funds to rent or purchase!). There was no expressed interest in computer facilities."

PO FORM NO. 1

Office Memorandum • **GEORGETOWN UNIVERSITY**

TO: All Departmental Chairmen DATE: March 1, 1972

FROM: L.R.C. Planning Committee

SUBJECT: Learning Resources Questionnaire

The L.R.C. Planning Committee has compiled, from previous discussions and correspondences with faculty, students, and administrators, a list of learning resource capabilities which the present Georgetown facilities and the future Learning Resources Center could have. The Committee's next goal is to obtain an estimate of the amount of use each such capability would have. That estimate will be derived from your response to the following questionnaire.

We ask that you, as a department, give your collective response to each of the items listed below. This statement of your particular present and future needs will be the primary directive for our next task: a proposal for a learning resources development plan, including a fairly precise statement of the Learning Resources Center's functional requirements, directly tailored to the expressed needs of Georgetown University. For this reason, we cannot overstate the importance of your thoughtful response to each of the items listed.

We recommend that you consider this questionnaire in a departmental meeting. In addition, we hope that your response will include that of students as well as faculty, to the extent that you consider it feasible and appropriate. Also, if one or more individuals in your department wishes to document their response separately, they should do so by Xeroxing and filling out a copy of this questionnaire. If you wish that a member of the L.R.C. Planning Committee be present when that meeting takes place, please call Joe Pettit (extension 4353) to let him know the time and place of the meeting. In any event, our working schedule requires that you return the completed questionnaire to Joe by Wednesday, March 22, 1972.

Aside each capability (facility) listed below, first indicate whether or not your department (school) presently uses it by checking one of the first two columns. If you do presently use it, give in the next two columns, an estimate of the course hours per week during which it is used and the total students enrolled in these courses. If you do not presently use it, but might use it in the future, check one or more of the next three columns as appropriate. If you do not presently use it and you foresee no future use for it, this will be indicated by your leaving these three columns blank. In the last column, indicate the priority which this item should have, relative to the rest of the items listed, from your own department's (school's) point of view. Do this by writing a number there from 0 (lowest priority) to 10 (highest priority).

Below the list are two additional sections which conclude this questionnaire. In the first section, please detail specific deficiencies you have experienced with specific present classrooms and supporting facilities. In the second section, you are asked to indicate any specific ideas you have which relate to the direction which the L.R.C. planning effort is taking.

We appreciate your time and consideration of these subjects. If you have any questions, please do not hesitate to call Joe Pettit on extension 4353.

	Presently Use?		Amount of Present Use		Anticipated Use			
CAPABILITY (FACILITY)	Yes	No	Course hrs. per wk. (no. of courses x hrs. per wk.)	Est. student enrollment in all courses using particular facility	Would use if available	Might possibly use	Don't know - Need more information	Priority
I. Basic classrooms (12-50 people)	___	___	___	___	___	___	___	___
A. Blackboard, chalk	___	___	___	___	___	___	___	___
B. Window shades	___	___	___	___	___	___	___	___
C. Electrical outlets	___	___	___	___	___	___	___	___
D. Audio/visual projector (eg. audio cassette, slides, overhead, film)	___	___	___	___	___	___	___	___
E. TV monitors	___	___	___	___	___	___	___	___
F. Other (specify)								
___	___	___	___	___	___	___	___	___
___	___	___	___	___	___	___	___	___
II. Lecture rooms (50-200 people)	___	___	___	___	___	___	___	___
A. Blackboard, chalk	___	___	___	___	___	___	___	___
B. Window Shades	___	___	___	___	___	___	___	___
C. Audio/visual projector	___	___	___	___	___	___	___	___
D. Portable microphone	___	___	___	___	___	___	___	___
E. Projector-and lighting-controls at lectern	___	___	___	___	___	___	___	___
F. TV monitors	___	___	___	___	___	___	___	___
G. Stage for in-class dramatic presentations	___	___	___	___	___	___	___	___
H. Other (specify)								
___	___	___	___	___	___	___	___	___
___	___	___	___	___	___	___	___	___
III. Other areas								
A. Seminar rooms (6-12 people)	___	___	___	___	___	___	___	___
B. Smaller rooms (2-6 people)	___	___	___	___	___	___	___	___
C. Laboratory/workshop areas (specify principal use) ___	___	___	___	___	___	___	___	___

CAPABILITY (FACILITY)	Presently Use?		Amount of Present Use		Anticipated Use			
	Yes	No	Course hrs. per wk. (no. of courses x hrs. per wk.)	Est. student enrollment in all courses using particular facility	Would use if available	Might possibly use	Don't know - Need more information	Priority
III. Other areas (cont'd.)								
D. Individual learning carrels (indicate special equipment required, if any) ______								
E. Large hall (up to 500 people) equipped both as a theatre and to support multilingual conferences, and otherwise convertible into one or more lecture rooms.								
F. Studio for audio tape production								
G. Studio for videotape production								
H. Excess (unscheduled) classroom space for ad hoc meetings, discussions, etc.								
I. Other (specify)								
______								
______								
IV. Audio-visual media								
A. 16 mm. motion pictures								
B. Super 8 mm. motion pictures								
C. Film strips								
D. Sound film strips								
E. 2x2 slides								
F. Opaque projection								
G. Overhead projection								
H. Record player								
I. Tape recorder (audio)								
J. Videotape (TV) recording								
K. Videotaped or live TV viewing								

	Presently Use?		Amount of Present Use		Anticipated Use			
CAPABILITY (FACILITY)	Yes	No	Course hrs. per wk. (no. of courses x hrs. per wk.)	Est. student enrollment in all courses using particular facility	Would use if available	Might possibly use	Don't know - Need more information	Priority
IV. Audio-visual media (cont'd.)								
L. Other (specify)								
________________								
________________								
V. Self-paced learning texts and related materials								
A. For remedial work								
B. For training in methodologies related to your discipline								
C. For other (specify)								
________________								
VI. Computer facilities								
A. For statistical work								
B. For simulation (modeling)								
C. For access to large volume of data (e.g. economic, social, linguistic, bibliographic)								
D. For purposes other than the above (specify)								
________________								
________________								
E. Computer terminals for any of the above (specify)								
________________								
F. Computer terminals for self-paced learning of remedial material								
G. Computer terminals for self-paced learning of methodologies related to your discipline								

	Presently Use?		Amount of Present Use		Anticipated Use			
CAPABILITY (FACILITY)	Yes	No	Course hrs. per wk. (no. of courses x hrs. per wk.)	Est. student enrollment in all courses using particular facility	Would use if available	Might possibly use	Don't know - Need more information	Priority
VII. Supporting services								
A. Audio/visual projector delivery service (to classroom at instructor's request)								
B. Audio/visual materials search, procurement, and/or delivery service								
C. Videotaping of classroom presentations/discussions								
D. Technical support to aid in production of audio/visual materials (slides, film, etc.) for classroom or individual student use								
E. Technical support to aid in use of computer in your discipline								
F. TV communication link between Georgetown and other institutions and related support								
G. Cassette-duplication service								
H. Centralized bibliographic search service for general use in research or teaching								
I. Other services (specify)								
____________________								
____________________								
VIII. Other capabilities (specify)								
____________________								
____________________								

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Detail below any specific deficiencies you presently (recently) have found with specific present classrooms and supporting facilities/services.

Specify below any comments you have with the direction which the L.R.C. planning effort is taking.

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